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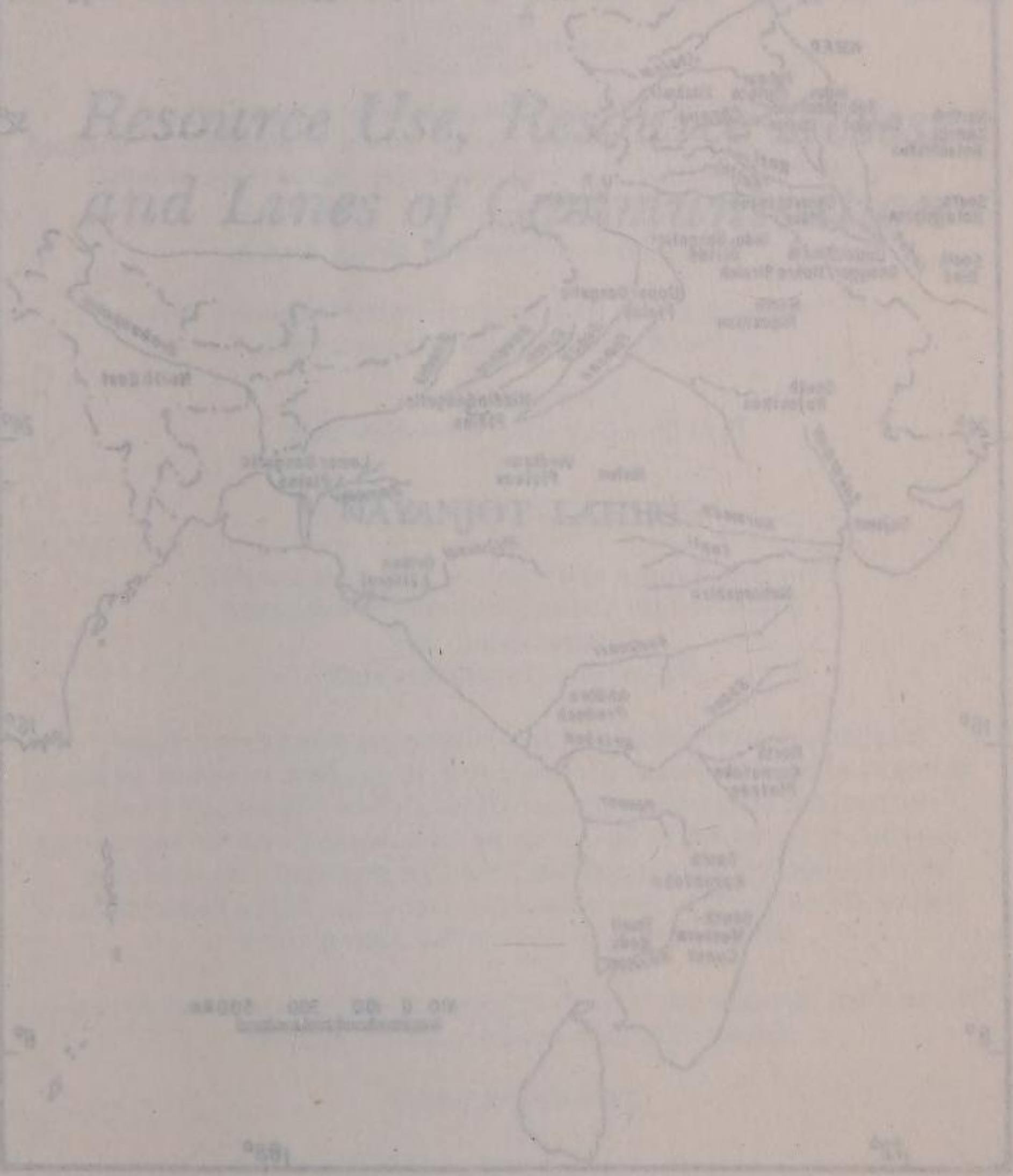
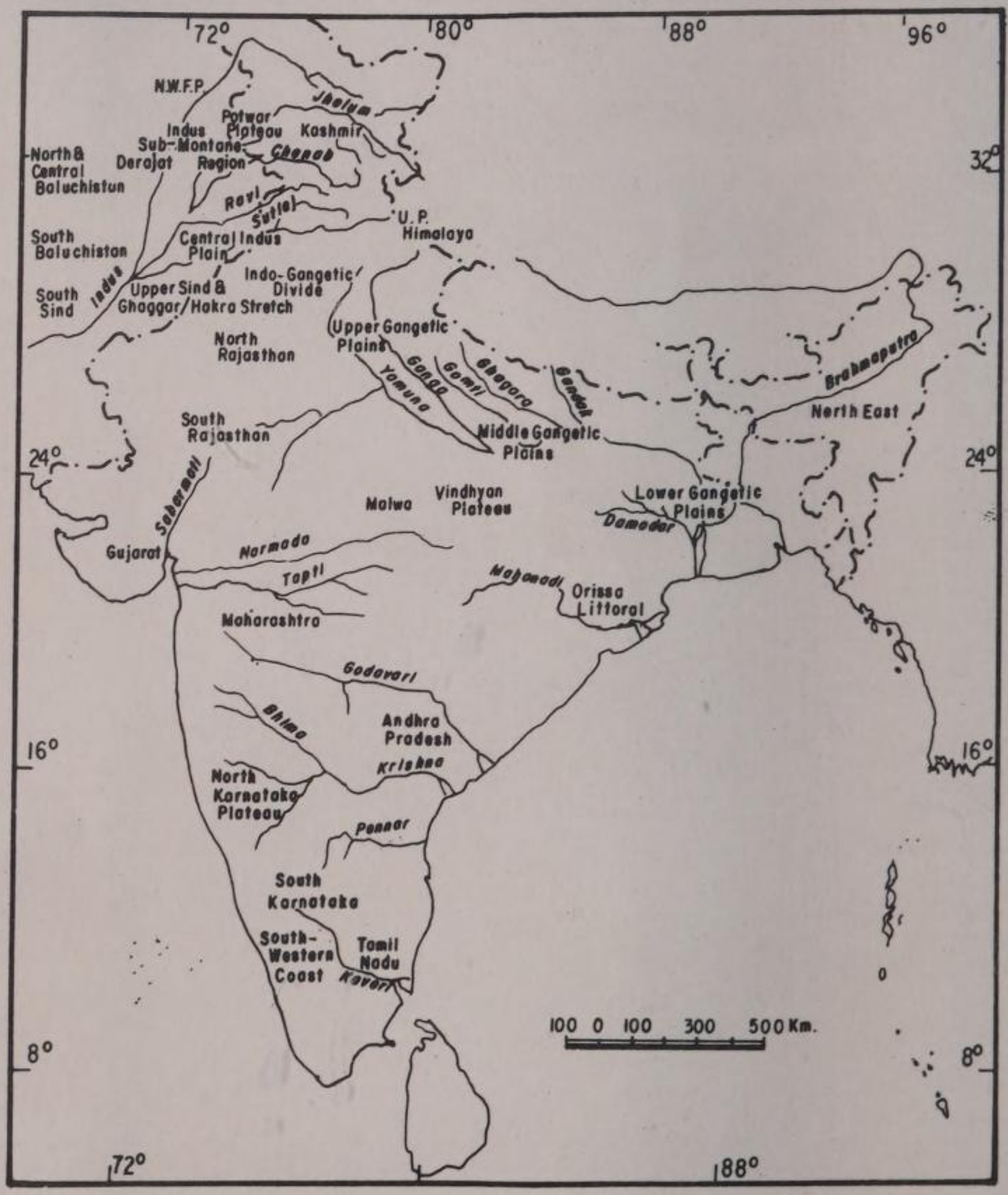


Map 1



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The Archaeology of Indian Trade Routes Upto c. *200 BC*

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NAYANJOT LAHIRI

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Abbreviations

AI	Ancient India
AP	Ancient Pakistan
ARASI	Annual Reports of the Archaeological Survey of India
ASI	Archaeological Survey of India
ASWI	Archaeological Survey of Western India
BDCRI	Bulletin of Deccan College Research Institute
CA	Current Anthropology
EW	East and West
GSI	Geological Survey of India
IAR	Indian Archaeology—A Review
IM	Indian Minerals
JAOS	Journal of the American Oriental Society
JAS	Journal of Archaeological Science
JASB	Journal of the Asiatic Society of Bengal
JIH	Journal of Indian History
JRAS	Journal of the Royal Asiatic Society of Great Britain and Ireland
MASI	Memoirs of the Archaeological Survey of India
ME	Man and Environment
MGSI	Memoirs of the Geological Survey of India
PA	Pakistan Archaeology
PPS	Proceedings of the Prehistoric Society
RGSI	Records of the Geological Survey of India
SAA	South Asian Archaeology
WA	World Archaeology

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Preface

This is a small book about a big subject—early Indian trade and trade routes. The theme, over the years, has been extensively and intensively scrutinized. The book does not, however, pretend to provide a comprehensive coverage of all aspects of interaction and commerce in India. Instead, it chooses to highlight some important, though neglected elements in the archaeology of trade routes. These are the specific raw materials that were utilized by various archaeological cultures from the beginning of food production till the second century B.C., for manufacturing a variety of objects, ranging from humble stone tools to exquisite jewelry, and the probable source areas of these raw materials. The linkages suggested by ceramic affinities and other artefactual similarities among contemporary cultural pockets have also been considered. On the basis of these variables, the different routes and lines of movement are outlined. The focus here is very much on lines of communication within the subcontinent itself and on their fluctuating destinies, not on the external trade routes.

The form and substance of this volume is practically the same as the first edition (1992). In the intervening years, there have been several archaeological discoveries as also new publications. Yet, if I were to try and integrate them, this would be not a new edition but a new book. Even in its present shape, it may be able to meet the needs of those who are interested in understanding the configuration of routes that evolved and through which a variety of cultural horizons, ranging from urban civilizations to more humble neolithic-chalcolithic pockets, articulated commerce and communication.

1

Introduction

THE SCOPE OF THE PRESENT WORK

The study of Indian trade routes has been characterized by a number of major trends. Some of these date from the nineteenth century, while others have emerged more recently. To begin with, one of the principal themes has been that of Indo–Roman trade (Forbes 1834; Elphinstone 1839; Charlesworth 1924; Wheeler 1954). Apart from examining the lists of goods and places mentioned in this context by the author of *Periplus of the Erythrean Sea*, Ptolemy and other classical writers, the extensive literature on this subject has concentrated on the routes from the Mediterranean to India, both before and after the discovery of the monsoon, and the major lines of communication between different Indian entrepots which were linked to this trade. In this connection, it is also worth recalling that India's Roman trade does not connote maritime trade alone. The vast West Asiatic landmass which intervenes between Rome and India also witnessed the development of a few major channels of movement to India—channels which, in fact, went beyond India, across the Pamirs to China. The nature of the basic configuration in this region has been dealt with, among others, by W.W. Tarn and M.E. Rostovtzeff. Tarn (1938) concentrated mainly on the Hellenistic period, whereas Rostovtzeff (1926) wrote in the context of Rome herself. The study of some of these routes in the Asian heartland also occupied a major portion of the early work of Aurel Stein (1921, 1929a, 1930) to whom goes the credit for systematically delineating the ways in which Buddhist missionaries and traders were keeping contacts with China (for some recent dimensions on this zone, Dani 1983a, 1983b). If we trace our steps backwards to the phase of the Indus urban phenomenon, the routes by which this civilization maintained her external links have come in for close scrutiny in recent years (Chakrabarti 1990; also Dales 1968; Ratnagar 1981; Asthana 1976; Shaffer 1980). At the other end of the subcontinent, it was south-east Asia which lay across the sea. The routes in this connection have been described in general terms by a

number of scholars and if one has to mention a modern name, H.B. Sarkar (1986) in *Trade and Commercial Activities of Southern India in the Malayo–Indonesian World* competently describes the changing pattern of routes followed by ships from India across the Bay of Bengal from the early centuries till the medieval period. On the whole, one would argue that the routes linking India with the outside world are fairly well understood and form the staple of any work dealing with the theme.

Unfortunately, this is something which cannot be said about the lines of movement in different periods within the subcontinent itself. The broad geographical routes of movement are, however, in this context quite clear. That this is so is not due to systematic historical or archaeological research (for some attempts of this kind, Beglar 1878:140; Acharya 1955; Sharma 1975; Deshpande 1981) but to the various attempts made in the 19th century by interested British administrators to know a great deal about this issue (cf. Scott 1853; Rennell 1793, reprint 1976; also literature cited in Bhuyan 1934). One understands that the listing of routes in a given area was often the normal thing to include in the gazetteer of that area. From this point of view, one of the major scholars was F.J. Richards (1933, 1922) whose seminal papers entitled 'Geographical Factors in Indian Archaeology' and 'Anthropological Geography' tried to analyse the patterns of movement pursued by the British, the Marathas, etc. to further their geopolitical interests on the one hand, and the different types of routes and movements within south India on the other. In extenuation, we may mention that a detailed exercise of this kind as far as India's north-west territories were concerned was undertaken as early as 1910 by T.H. Holdich in his *The Gates of India.* In the field of historical research, the knowledge of India's trade routes is intimately related to the study of ancient India's Buddhist literature, in which context T.W. Rhys Davids' (1903) still useful *Buddhist India* with its brief section on Indian trade routes published in the beginning of the present century is noteworthy (for the early editing of the Buddhist literature, Rhys Davids 1890–94; Fausboll 1877–97, 1898; Oldenberg 1879–83, 1883). The entire idea of the Great Deccan Route, for instance, linking Rajagriha in Magadha with Pratisthana on the Godavari was derived primarily from Buddhist literature. The geographical data contained in the Epics and Puranas also elucidated the different sections of the problem of internal routes. The works which have come to be written on ancient Indian trade and commerce are based principally on these kinds of sources helped in many cases by the location of, and the related finds at, many excavated archaeological sites (cf. Samaddar 1922, reprint 1984; Das 1925, reprint 1980; Buch 1924; Fick 1920; Rhys Davids 1901; Banerjee 1925;

reprint 1980; Chakraborti 1966; Mishra 1954; Srivastava 1968; Moti Chandra 1977; Bose 1942, reprint 1961; Hertzman 1984). In the early historical period, another major source is the inscriptional wealth from various Buddhist monastic establishments. The inscriptions and the locations of the Buddhist rock-cut monasteries in different parts of western India, for instance, are a principal pointer to the movement of goods and people in that region during the early historic period (for a recent use of the inscriptional sources in the context of the Satavahanas, Ray 1986).

The present work aims to make a detailed study of the problem of trade routes in the context of India as a whole during the protohistoric and the first phase of the early historic periods up to c. 200 BC. While taking cognizance of the sources mentioned above, the main attempt of this survey is to understand the utilization of certain specific raw materials by the archaeological cultures in different periods, the delineation of the probable areas which could have supplied the raw materials (for the pre-industrial knowledge of even limitedly available raw material, LaTouche, cited in Lawrence 1895:61) to these cultures and, on this basis, the essential direction of trade routes in, and across, distinct zones. Apart from the textual narrative, these data have been systematized in a number of charts and maps. We are aware that the presence of a raw material in a given area does not necessarily mean that this particular raw material used by the archaeological cultures of that area was collected from there. Scientific studies on the determination of the provenance of archaeological objects are very important for determining the origin of a class of raw material. However, pending a wide application of such scientific techniques in Indian archaeology, we have tried to formulate a detailed analysis of the probable areas from where the protohistoric and early historical cultures of India could have procured their raw materials. We have also considered the ceramic and other artefactual linkages among different cultures to further explore the relationships among diverse cultural zones. Additionally, settlement pattern data are useful in suggesting the orientation of the possible routes. Such data are used as far as possible, although it is necessary to point out that often, because of limited research or even because of the nature of the intervening environment, two regions which otherwise provide indisputable archaeological evidence of contact, may not leave any significant pointers as to the exact routes which were followed. In the context of the early historical period, an analysis of the literary images of the grand routes of *Uttarapatha and Dakshinapatha* and their material correlates in the form of archaeological data scattered along these routes are also presented.

These are very specific archaeological issues which, if considered for the subcontinent as a whole over our chosen period, will highlight not merely the arterial lines of communication but also their significance in different periods. One of the postulates which has been critically examined here is the idea of continuity of protohistoric and early historic Indian trade routes.

THEORETICAL APPROACHES TO TRADE IN THE INDIAN CONTEXT

The last few decades have generated an extensive literature on the archaeology of trade, an acceleration which stems partly from a recognition of exchange as important in the study of cultural systems and partly from the development of a number of scientific techniques to study various raw materials and finished products. Such writings have encompassed a number of themes and may be grouped into three categories. Firstly, several advances in the scientific study of raw materials have taken place. These include petrological examination of thin sections of stone tools (Thomas 1923; Clough and Woolley 1985; Clough 1985), optical spectroscopy of metals (cf. Briton and Richards 1969:509) and obsidian (Cann and Renfrew 1964; Cann et al 1969; Renfrew et al 1966, 1968), Atomic Absorption spectroscopy of stone (Craddock et al. 1983:135–63) and pottery (Tubb et al. 1980), X-ray fluorescence and diffraction of metals (Fabris and Treloar 1980; Avaldi et al. 1984), jet (Pollard et al. 1981), obsidian (Stevenson et al. 1971; Stross et al. 1971), and talc (Kohl et al. 1979; Kohl 1974, 1975), particle or proton induced X-ray emission analysis of pottery (Rye and Duerden 1982) and metals (Ferriera and Gil 1981), Neutron activation analysis of obsidian (Gordus, Griffin and Wright 1971) and metals (Wyttenbach and Schubiger 1973; Tindal and Brown 1979), lead isotope analysis of metals (Brill and Whampler 1967; Gale and Gale 1981) and so on. Secondly, a number of analytical techniques, often drawn from different disciplines, are being increasingly used to situate archaeological data bearing on exchange relationships within a broader spatial and social framework. The models that lie behind current archaeological interpretations of trade are systems theory (Renfrew 1969, 1972; Doran 1970; Elliot, Ellman and Hodder 1978; Wright and Zeder 1977), network and locational analysis (Renfrew 1972, 1977; Hodder 1974; Ericson 1977; Plog 1977), and ethnographic data and concepts derived from social theory (Rowlands 1971; Pires Ferriera and Flannery 1976; Bender 1978; Hodder 1982). Thirdly, the larger theoretical conception of the nature and significance of trade is also an important archaeological issue. A number of concepts borrowed from sociology and economics such as reci-

procity (Clarke 1965; Renfrew 1972), gift exchange (Morris 1986; Hodder and Orton 1976), redistribution (Renfrew et al. 1976), etc. have augmented conceptual rethinking among archaeologists on the place of trade in the past and the reflection of these different dimensions in the artefactual record.

Although there has been a general theoretical preoccupation with ancient trade, the following review hopefully serves the purpose of demonstrating that the current state of research in India in these directions has been sporadic, limited in scope and lacking in the rigour and depth that such scientific techniques and conceptual categories require.

The Scientific Study of Raw Materials

The urgency of applying scientific techniques on a systematic large-scale basis to important cultural problems is widely acknowledged in Indian archaeological circles. Some attempts to use the range of equipment available for the kind of analysis which is potentially useful to the archaeology of trade and trade routes have also been made. Petrographic analysis (Karanth et al. 1986), spectroscopic techniques including Atomic Absorption Spectroscopy, X-ray fluorescence analysis, (Subbaraman 1974–75; Agrawal et al. 1978; Avadhanulu 1979) and lead isotope analysis (Hegde 1985) have been used to study the elemental composition of natural sources and finished artefacts ranging from coins to lime plaster.

However, chemical and technical analysis of artefacts and raw material sources which forms the basis of outlining exchange networks, has not attained any kind of sophistication or depth in India. Firstly, no extensive ore–artefact correlation study has yet been taken up here. Much has been made in Indian protohistoric studies of the Khetri mines of Rajasthan being the source of copper in the Harappan and post-Harappan period. It is sobering to keep in mind that not more than half a dozen samples from the ore deposit which covers a large part of Rajasthan have been analysed. D.P. Agrawal (1971:13) has underlined this point strongly: 'A larger number of analyses of the Indian ore-bodies is a desideratum for work on these lines.'

Furthermore, most writings on the economic history of ancient India and on issues like trade routes do not always display an adequate perception of the significance of these data which, although limited, do admittedly exist in India. For instance, a recent archaeological work on the Satavahana–Kshatrapa period (Margabandhu 1985) in its section on 'Trade, Transport and Exchange' makes no mention of the technological studies of the silver and lead coins of this period (Hegde 1967, 1968). Although the lead coins of the Satavahanas are referred to by Margabandhu (1985:70), the proba-

bility that the ore body of this metal was located at Zawar, as Hegde argues, is not considered significant and germane to his discussion of the trade and trade routes of this period. Metallographic analysis of different coin types does not even figure prominently in the agenda of numismatic studies in India—The Presidential Address at the 69th Annual Conference of the Numismatic Society of India on 'Pre-Satavahana and Satavahana Coinage of the Deccan' which was completely silent on the work of K.T.M. Hegde is illustrative of this theoretical limitation (Shastri 1982).

In fact, a qualitative leap in studies on trade in India can only happen if (i) detailed and large-scale scientific studies on different kinds of artefacts and their raw material sources are undertaken, and (ii) imaginative but rigorous, non-traditional questions are posed to the archaeological data base.

Metals

In metallurgical studies, maximum research has been done in the field of copper ore and artefact analysis. The scientific analysis of other metals such as silver, lead and iron is much more limited and fragmentary in nature (for a review of metallurgical studies in India see Bhardwaj 1981–83).

One of the major problems in provenance studies has been to decide which of the 75 metal elements are useful for element analyses. Muhammad Sanaullah (1940, reprint 1974) who analysed forty-eight specimens from Harappa, organized them on the basis of the presence of arsenic, nickel and lead; he distinguished Harappan copper from Sumerian copper by the virtual absence of arsenic in the latter. It has subsequently been shown that nickel is not generically associated with copper but comes from the iron ores only as a contamination (see Agrawal 1971:142), On this basis, V. Nautiyal et al. (1981) in their analysis of Harappan, copper hoard and miscellaneous copper objects from certain chalcolithic sites, indicated that Harappan and chalcolithic objects invariably showed impurity of nickel which, in the opinion of the authors, probably indicated a common source of copper, and that the copper hoards formed a separate category as nickel and tin were absent from them. While there is still a tendency to isolate one element for arguing for the utilization or non-utilization of a particular body of ore (cf.M.Lal 1980–81:74), most studies have suggested correlations based on a spectrometric analytical similarity between various elements. K.T.M. Hegde (1969), for instance, has outlined a comprehensive approach to the scientific study of copper and copper alloy artefacts in his analysis of the Ahar artefacts by focusing on the total impurity pattern. In his studies of the lead and silver coins of the Kshatrapa period also, Hegde (1967, 1968) relied on the total pattern

of impurities in the coins and ore samples to suggest the existence or absence of a correlation. Similarly, D.P. Agrawal, whose *The Copper Bronze Age in India* (1971) was a pathbreaker inasmuch as it not only summarized all the work done till then but also included the results of his own research, followed in the element analysis of artefact and ore samples the approach of A.M. Freidman and his colleagues, depending mainly on silver, arsenic, bismuth, iron, antimony and lead concentrations to determine the copper ore sources.

There have been other definitive scientific analyses of metal objects using a number of techniques. Among the more comprehensive studies is the analysis done by K.V. Subbaiah and Sreelatha Rao (1984) of one thousand coins of the medieval period which were analysed both by conventional wet procedure and by Atomic absorption spectroscopy. Additionally, slag samples from Dariba–Rajpura. Rampura–Agucha (Rajasthan) and one from Agnigundala (Andhra Pradesh) were analysed. The inter- and intra-dynasty fluctuations that emerged in the element concentrations of the coins of the four dynasties were significant, and suggested the use of different sources of raw material. For instance, the 545 coins of the Nizam Shahi dynasty showed an increase in the lead, silver, antimony and bismuth content relative to coins of the preceding Barid Shahi dynasty. Multiple techniques were also used by A.B. Avadhanulu (1979) in a study of the potin coins, belonging to the period of Vasishthiputra Pulumavi (86–114 A.D.). Three different methods i.e., conventional wet procedure, X-ray flurocscence analysis and Atomic absorption spectroscopy were used to analyse the major elements i.e., copper, tin and lead. The trace elements—manganese, cobalt, nickel, zinc, silver and lead—were estimated by the use of Atomic absorption spectroscopy and the remaining trace elements viz., magnesium, aluminium, silicon, titanium, vinadium, chromium, iron and antimony by liquid extraction/colorimetric methods. Avadhanulu reported that while there was a close agreement in values obtained by conventional and Atomic absorption spectroscopy methods, there was considerable difference in those recorded by X-ray fluorescence analysis; in the latter case, there was a synchronous variation (decrease) in values for copper and tin.

Spectroscopic analysis of the ratio of different elements, however, is dependent upon the smelting process and level of technology which were used in the production of the analysed artefacts. The more recent and accurate method which has now begun to be used in India, is based on the relative proportion of lead isotopes which vary somewhat among ores occurring in different geographical areas. The University of Baroda in collaboration with the

Murovan Institute of Technology, Japan (Hegde 1985) undertook the lead isotope analysis of six ancient copper ore mining and smelting sites in the Aravalli hills that included Kankaria and Piplawa in the central part and Deri and Ambaji in the south-western part. It was mentioned that the copper used in the objects found in excavated chalcolithic sites in north-western India (which have more than 1 per cent lead in their composition) was not obtained from the copper ore belt in the north-western part of the Aravalli hills which have less then 0.0004 per cent lead. The results of the lead isotope analysis done on some Satavahana lead coins from the British Museum collection were more specific (Seely and Turner 1984:331), and were found to fall into two groups: (i) one group which falls close to those obtained from the Zawar ores with perhaps the inclusion of some scrap metal from the second group and (ii) those which are different from any Asian sources of lead, but which match closely those of the Sardinian and Spanish lead sources exploited by the Romans. Seely and Turner's conclusion on the import of Roman lead, incidentally, has been questioned by Chakrabarti (1989:128) who has suggested the possibility of the lead ores of the Satavahana country of Maharashtra–Andhra as having been exploited.

Although the chemical analysis of ancient Indian iron artefacts began from the middle of the 19th century (cf. Chakrabarti 1981–3:81), most studies on iron samples are appended to excavation reports—Prakash (Athavale 1964–5), Dhatva (Hegde 1975), Atranjikhera (Agrawal 1983) are some of them. One may also mention H.C. Bhardwaj's work (1968–9; also Bhardwaj 1973) on the iron samples from Rajghat (600–400 BC). In addition to discussing the level of technology as reflected in the samples, Bhardwaj argued that the Rajghat iron samples must have been from titaniferous ores with apatite complex, probably of Bihar provenance.

The major limitation with Indian metallurgical studies remains that of the paucity of samples, especially with regard to those from mining and smelting sites. This incomplete picture, in fact, often vitiates the conclusions that are drawn from the scientific data. Hegde's (1967:63–6) otherwise important scientific analysis of two silver coins of the Kshatrapa dynasty from Devnimori compared their pattern of impurities only with the ore sample of the Zawar mines, and since they were vastly different, he suggested that the silver used was imported, without considering the possibility of argentiferous galena deposits found in other localities in India being exploited in Kshatrapa times. Some other limitations of metallurgical studies in India have been summed up by P. Yule (1984:312):

> Since the publication of the large-scale recovery operations of the 1920s and 1930s in the Indus Valley and Baluchistan, few serious, concentrated studies have appeared on the early metalwork of this area. Recent work has dealt with metallurgical aspects (Agrawal, Prakash), foreign connections (Deshayes, Lamberg–Karlovsky) and the attribution of particular assemblages to certain ethnic or linguistic groups. The methods of publishing metal objects by the pioneer excavators, while typical for their time, do not always render a clear and complete impression of the appearance of these objects, let alone inform us as to their development and distribution. . . .the study of South Asian metalwork lags far behind the modern standard in several essential respects.

Miscellaneous Studies

The potential of scientific techniques in illuminating the sources of raw material used in various non-metallic artefacts is only recently being realized. We propose to briefly discuss below the work done on pottery, medieval plaster and Gandharan schist sculptures to merely suggest the scope that exists for understanding local and inter-regional patterns of exploitation and exchange through such studies.

D.R.C. Kempe (1982:25–8) of the British Museum in 1982 published the results of the analysis of the Gandharan sculptural schist. With the use of XRF, AAS and CHN analysis he examined and confirmed a fragment of the common bluish grey sculpted rock as a chloritoid–paragonite–muscovite quartz schist, with some plagioclase, biotite and carbonaceous material. Although no definite source localities were identified by him for the stones used by the Gandharan sculptors, he suggested that it came from the Swat area.

There is also a growing attempt to use petrographic analysis to determine the provenance of the raw material used in pottery and building materials. In the case of Harappan Lothal, such an analysis revealed the use of locally available clay widely found in the mud flats near the site (Panjwani 1989). In the study of pottery from a shell midden in South Andaman, the petrological study, which was supplemented by X-ray diffraction, revealed that the local soils contained the predominant minerals found in the 13 potsherds examined (Cooper and Raghavan 1989). The plaster from certain 7th–8th century AD structures in Karvan (Gujarat) has also been petrographically analysed by R.V. Karanth, K. Krishnan and K.T.M. Hegde (1986). The lime plaster specimens revealed that the particles were composed of rock fragments of granites and basalts, and mineral fragments of quartz, felspar, augite, mica, brown bornblende and actinolite. A study of the drainage and the geological strata suggested that the sand used in the preparation of the plaster was collected from the bed of the Orsang river, downstream from Chanwara village, which is 15 kms east of Karvan. This is the place where the Huen river (which drains basalts and alkaline rocks which also possess brown hornblende) and the Orsang river

(which flows through pre-Cambrian formations and the Deccan traps, the possible source for the rock fragments of granites and basalts and the fragments of granites and basalts and the fragments of quartz, felspars, augite, mica and actinolite) meet.

Interpretative Issues

By and large the literary data provide the main background tapestry of the general range of writings on Indian trade. Moti Chandra's (1977) *Trade and Trade Routes in Ancient India*, B Srivastava's (1968) *Trade and Commerce in Ancient India*, H.P. Chakraborti's (1966) *Trade and Commerce of Ancient India* are good examples of this primarily literary approach.

Serious dissatisfaction has been expressed by a number of archaeologists (Malik 1972–3; Paddayya 1980, 1981–3, 1985; Dhavalikar 1978–9; Sankalia 1977) on the non-application of the theoretical developments of the west in India. In this context, it is useful to remember that the widespread adoption of explicitly formulated analytical models there, which was part of the general movement for a 'New Archaeology', was largely a consequence of the systematic use of scientific and quantitative techniques. The creation of a scientifically analysed and understood data base in India as a prerequisite for a more meaningful appropriation of such theoretical approaches has not been sufficiently highlighted. This, incidentally, is true for a number of other disciplines as well. S.K. Biswas (1979:164), commenting in 'On Systems Theory in Anthropology', had this to say about its application in the Indian context:

> In a situation like ours, in which concern is constantly expressed over the uneven development of the conceptual frameworks and research techniques necessary for appreciating reality in the Indian context, any attempt at application of even sophisticated logico–mathematical models should be carefully considered. The choice should be determined by our concern: can this approach cirumvent information gaps in anthropology?

In fact, 'theory building' is sometimes done here without even the elementary exercise of data collection and analysis. In a recent use of the notion of the 'gateway' city model in the model in the context of Harappan trade (Ratnagar 1982), the lack of craft specialization, an axiomatic feature of this construct, at Harappa was noted, which even a basic reading of the excavation report would show to be completely unfounded (cf. Lahiri, 1990). Hence, when archaeologists are invited to think about cultural phenomena, complex as they are, entirely in terms of the currently fashionable metaphors, without first going through the 'blue collar' drudgery of a careful empirical study, very questionable theoretical propositions are not infrequently accepted.

Perhaps one of the notable examples of an original recovery of information on past exchange relations is the pioneering matrix analysis which was done on the Jorwe pottery by M.K. Dhavalikar and A.R. Marathe (1978:917–22) through the application of computers. In order to understand the similarity and differences between the pottery from Chandoli, Nevasa and Inamgaon, six quantitative characters of the pottery were analysed—maximum height, maximum diameter, diameter at 3/4th height, diameter at 1/2 height, diameter at 1/4th height, and thickness of the pot. A sample of twenty-five pots from Chandoli, thirty-three from Inamgaon and thirty-six from Nevasa were considered, and the data analysed by a computer. From the statistical analysis it became clear that the overall profile of the Inamgaon and Chandoli pots was similar, while significant differences existed in the pottery of Inamgaon and Nevasa. Dhavalikar and Marathe (1978–9:22) suggested that: 'This similarity leads us to infer that in all probability the Inamgaon potter was supplying pottery to all the inhabitants of Chandoli. The latter, however, was a small settlement, almost a hamlet, and could not have afforded the services of a full time potter'. A systematic use of ethnographic data to facilitate interpretation of exchange distribution patterns is available in the work of D.K. Chakrabarti (Chakrabarti 1990; also Chakrabarti 1977a). *The External Trade of the Indus Civilization,* and its archaeological dimensions are placed by him in the context of the ethnographic evidence of preindustrial trade between central Asia, Afghanistan, Iran, the Persian Gulf, Baluchistan and the Indus valley. This scenario provides the context for understanding many such interactions in the protohistoric period (Chakrabarti 1977a:30–1):

> Perhaps the most obvious of these implications is that the "western" artefact type found in the Indus system and the associated areas in the north west, which have been usually interpreted as archaeological evidence of different population movements may more satisfactorily be explained as nothing more than what they apparently are: isolated objects finding their way in through trade or some other medium of contact, not necessarily any population movement of historic magnitude.

Another recent example of past exchange networks being situated in an ethnohistorical context is B. Allchin's (1985:27) overview of the general patterns of movement in Baluchistan and Gujarat. In Allchin's opinion, an understanding of the Badawal community of nomadic stock breeders who travelled every year from Gujarat to Central India and back, selling various products along the way, is useful in understanding similar exchanges in the protohistoric period.

2

The Cultures Antecedent to the Harappan Civilization

The simple descriptive label 'the cultures antecedent to the Harappan civilization' hides a great amount of geographical, chronological and cultural complexity. The geographical spread of these cultures is over the entire north-western stretch of the sub-continent up to eastern Punjab and Haryana. There are sub-regions within this region: (1) north and central Baluchistan, (2) south Baluchistan which covers the area between the Chagai hills and the Makran coast and partly, the hills of central Baluchistan as well, (3) Indus sub-montane tract, (4) Derajat region, (5) Potwar plateau, (6) central Indus plains, (7) southern Sind, (8) upper Sind and the Ghaggar–Hakra stretch, and finally, (9) eastern Punjab and Haryana. It is possible to designate these sub-regions differently but we propose to adopt the above-mentioned scheme for our discussion. The chronological span is roughly between 7000 B.C., when the process of wheat–barley cultivation and animal domestication began at the basal level of Mehrgarh in the Kacchi plain, and the first half of the third millennium BC when the 'early Harappan' Kot Dijian culture took its basic shape, possibly first in lower Sind and the adjacent region. The chronological situation is made complex by two major factors—the advent of 'consensus calibration' of radiocarbon dates, which permits a rather large time-spread from which to make one's inference (cf. Possehl 1988), and the gradually emerging evidence that the date of a major culture may vary in different parts of its distribution area (cf. the varying dates of the Kot Dijian culture in Sind and the Potwar plateau). Culturally, although the basic archaeological sequence of the different sub-regions is well established, the data are unevenly spread and understood. For instance, one would like to know more about the horizon related to the Hakra ware towards the east of the basic Indus system where this is said to mark the earliest village level.

These and other complexities have been discussed by various scholars (cf. Mughal 1971; Fairservis 1971; Allchin & Allchin 1982; F.R. Allchin 1982a; Shaffer 1979; Chakrabarti 1984a; Asthana 1985). The focus of the present chapter is, however, strictly limited. Our

purpose is to determine the routes of interaction through which trade and other objects of exchange moved, on the one hand, among the various culture zones in Baluchistan and the Greater Indus Valley, and on the other, between them and other neighbouring zones of habitation in West Asia, Central Asia and Afghanistan. The diffusion of diverse ceramic styles and the consequent presence of interregional artefactual links, along with the resource–use and resource–access of different sub-regions provide the general framework for visualizing the possible major lines of movement.

DATA ON INTERNAL INTERACTION

North and Central Baluchistan

Fringed by the Toba Kakar and Suleiman mountains in the north, and the Kirthar in the south, this is a region of rugged, barren hills, interesected by stony plains and plateaux. It was, however, along the valleys watered by the large number of streams and rivers of which this region boasts—the Kurram, Zhob, Gomal, Thal, Anambar in the north and the Mula, Gaj, Nari, Beji, Morad and Chawal in central Baluchistan—that the settlements of this period grew. While many of the routes emanating from and passing through this area were originally explored by Aurel Stein (1929b; for a later assessment see Piggott 1946, 1947, 1950), the subsequent work of the American Museum of Natural History from New York under Walter Fairservis Jr. (1956, 1959) in the Quetta, Pishin, Zhob and Loralai districts and that of the British Archaeological Mission to Kalat under the leadership of Beatrice de Cardi (1964, 1965, 1984) in central Baluchistan were instrumental in the identification of concentrated pockets of pre-Harappan sites and in the reconstruction of the cultural stratigraphy of the region as a whole. It is, however, the work of the French Archaeological Mission since 1973 on the site of Mehrgarh at the foot of the Bolan pass, one of the most celebrated routes between Baluchistan and the Iranian plateau, which has largely rewritten the protohistory of the entire region by providing the earliest and most complete archaeological sequence available for any of its sites (Enault and Jarrige 1973; Jarrige and Enault 1973; Jarrige 1981, 1984; Jarrige and Lechevallier 1979; Lechevallier and Quivron 1981; Santoni 1989; Dani 1988).

Ceramic and Other Artefactual Links

This sub-region shows ceramic links with the Nal and Kulli cultures of south-central Baluchistan, upper Sind and the Ghaggar–Hakra sub-region, and southern Sind.

The ceramic links between central and south Baluchistan are manifest primarily in the distribution of Nal designs in this area, along with some Nal type pottery. De Cardi (1984, 1965) has noticed the presence of Nal motifs at Anjira and Siah Damb in Sarawan (de Cardi 1984:64) and at sites like Saiyid Maurez, Barra Kapoto, the Ispelinji valley mounds and Sardar Khel in the region between Surab and Quetta. At Saiyid Maurez the shoulder of a canister with typical Nal monochrome decorations (de Cardi 1984:66, fig. 9.2, no. 9) could be a direct Nal import. Two sites in the Mula pass area showed Nal wares on the surface (de Cardi 1964:28). The Nal polychrome type has been observed in Mehrgarh VI and VII in the Kacchi plain (Enault and Jarrige 1973:188). In addition to noting the striking similarities between certain polychrome designs found in the Damb Sadaat II level (542, 543 and 544 in Fairservis 1956:354) and on Nal canisters (531 and 541 in Fairservis 1956:354), Fairservis (1956:354) has argued that the Kechi Beg 'white-on-dark slip' is analogous to the Nal 'white-on-black'. The Kulli pottery, on the other hand, does not seem to have such clear affiliations with the region as a whole. Kulli designs—the hatched wavy lines, palm trees and other vegetal motifs, the back of a bull etc.—seem to be best represented in the Bolan–Kacchi area (Enault and Jarrige 1973:190–3). While some limited elements such as the hatched treatment of the bodies of the bulls and their large circular eyes (Fairservis 1956:355) in the Quetta valley seem to be influenced by Kulli ceramic motifs, only a couple of sherds of Kulli affiliation are to be found in the Zhob valley (Fairservis 1959:355).

Kot Dijian elements, strongest in the Quetta, Zhob and Loralai valleys, bring out the ceramic links with upper Sind and the Ghaggar–Hakra stretch. Mughal (1972a:144–5) identified five sites with Kot Diji ceramic association in the Quetta valley: Damb Sadaat, Jagjai, Quetta Miri, Spina Ghundai and Srakala. Some pieces of globular vessels with short necks and everted rims (cf. in Damb Sadaat I and II) could even be direct Kot Diji imports (Mughal 1971:271). The Kot Dijian ceramic affiliations can be noticed at a number of Zhob valley sites including Periano Ghundai, Moghul Ghundai etc. (Mughal 1971:219–20, 222–3; 1972a:140–2). At both Sur Jangal and Rana Ghundai in the Loralai valley, fragments bearing a number of similarities to Kot Dijian types have been noticed in different stratigraphic contexts (Mughal 1971:241, 246). Mehrgarh (VII) has also yielded some Kot Dijian pottery. Although features of some Kot Dijian diagnostic types admittedly exist in the Surab valley, they are found in the indigenous wares of the region, and apart from the forms, their links with Surab ceramics are nowhere as clearly defined as in north Baluchistan (Mughal 1971:250, 280).

The ceramic links with southern Sind are clear from the strong Amri influence in the Surab region. The Amri affinities extend to the style of painting as, for instance, the propensity for geometric designs at Siah Damb and the Ispelinji valley sites (Mughal 1971:288; de Cardi 1965:16), as well as the general surface treatment, the 'sand slipped pottery' of coarse fabric with parallel striations on the external surface found at Siah Damb (cf. level II, i) being one such example. These parallels become less clearly defined, relatively speaking, as one proceeds to the north. The suggested Amri parallels with the sites of the Quetta and Loralai valleys are confined to decorative techniques and motifs—diamond and sigma (cf. Damb Sadaat I which are broadly similar to those of Amri IA and C), the painted checker and fish scale designs (cf. Rana Ghundai and Sur Jangal which resemble those found in Amri ID levels) (Mughal 1971:269–71, 247–9).

The Sitewise Distribution of Raw Materials

The variety of raw materials which were utilized in the production of diverse artefacts is clear from a reading of Charts 1a–b. Briefly, these raw materials are steatite, alabaster, marine shells, lapis lazuli, turquoise, carnelian, chalcedony, jasper, flint/chert, schist, quartzite, sandstone, calcite, phtanite, limestone, shalc, basalt, lead and copper/bronze.

The Evidence of Manufacture of Finished Products at Different Sites

Steatite: The remains of a workshop where steatite was cut and worked into beads, dating to the 5th millennium BC have been unearthed at Mehrgarh (Jarrige 1981:99).

Shell: That some of the shell artefacts found at Mehrgarh were manufactured at the site itself is evident from the presence of one columella of *Fascolaria Trapezium* shell (Period II), and fragments of *Xancus pyrum* (Period III) (Jarrige 1981:99, 109).

Semi-precious Stone: At Mehrgarh (III), as seen on the surface of M.R. 2, a large number of flakes, unfinished beads and fragments of lapis lazuli, turquoise, carnelian and other semi-precious stones, together with drills in flint and phtanite micro-drills suggest the presence of a bead-making workshop there (Jarrige 1981:99).

Ordinary Stone: Evidence of local chert/flint blade industries is available from Anjira, Sur Jangal, Rana Ghundai, Kili Ghul Mohammad, Damb Sadaat, Mehrgarh and Khoedada. Anjira (I–III) has yielded a number of small chips, together with some cores and fragments of snapped blades showing no definite signs of either working or of

Chart 1 a*

NORTH AND CENTRAL BALUCHISTAN—PRE-HARAPPAN PERIOD

Raw Material	*Mehrgarh*	*Lahar*	*Khoedada*	*Haji Qaim Khan*	*Jagjai*	*Bhut Shamsi*	*Ispelinji*	*Anjira*	*Sur Jangal*
Steatite	amulet, seal, beads								
Alabaster	vessel fragments	vessel fragments				bowl	bowl		
Shell	beads, pendant, columella, bangles, fragments, bracelet								
Semi-Precious Stone	Carnelian beads, fragments, flakes					Carnelian beads	Agate object		
Lapis Lazuli	beads, flakes, fragments				beads				
Turquoise	beads								

* The notes to charts in this work are available at the end of each chapter.

(Chart 1 a contd.)

Raw Material	*Mehrgarh*	*Lahar*	*Khoedada*	*Haji Qaim Khan*	*Jagjai*	*Bhut Shamsi*	*Ispelinji*	*Anjira*	*Sur Jangal*
Ordinary Stone	Flint cores, blades, burins, beads, scrapers, borers, lunates, trapezes, arrowheads, sickles. Marble disc. Phtanite micro drills. Schist chisels. Sandstone tools. Limestone grinding stones, vessel, perforated stone, beads	Chert blades	Chert blades & cores	Chert blades & scrapers	Chert blades		Chert blades	Chert blades, gouges, flakes, scrapers, arrowhead, flake fragments & miscellaneous microliths. Schist tools. Quartzite tools	Flint flakes, burin-like object. Sandstone grinding stone fragments. Limestone ball
Copper/ Bronze	pins, chisel, fragments, axe, rods, bead, ring			bits				bits	
Lead	fragments								

Chart 1 b

NORTH AND CENTRAL BALUCHISTAN—PRE-HARAPPAN PERIOD

Raw Material	*Rana Ghundai*	*Periano Ghundai*	*Kili Ghul Mohammad*	*Q13*	*Q8*	*Damb Sadaat*	*Kechi Beg*
Steatite			disc fragment	bead			
Alabaster		vessel fragments	sherds			sherds	
Shell						ring, bangles	
Semi-Precious Stone			Chalcedony blade, beads. Jasper blades			Chalcedony blades	
Lapis Lazuli				bead			
Ordinary Stone	Flint blades, core. Calcite frag-ments		Chert blades, chopper like object, cores Limestone object		Shale-celts. Lime-stone spindle whorls	Chert blades scrapers, cores. Lime-stone balls. Sandstone balls	Basalt ball
Copper/ Bronze		pin, arrow-point	chisel			dragger, brooch, fragment	
Lead						ore	

use (de Cardi 1965: 123). The large number of unretouched flint flakes recovered from Sur Jangal (from the surface and from excavations), in the opinion of Fairservis (1959:205) are the by-products of stone tool manufacture. Rana Ghundai has yielded a polygonal flint core (Fairservis 1959:301). Chert cores were found at Kili Ghul Mohammad, Damb Sadaat and Khoedada (Fairservis 1956:235, 238; Mughal 1972a:144). Flint lithic material at Mehrgarh, which is found from Periods I to VII, was undoubtedly also manufactured at the site itself as is evident from the presence of waste material there (Jarrige and Lechevallier 1979:469). For instance, in Period I 225 artefacts (7.6%) in flint were classified as waste material.

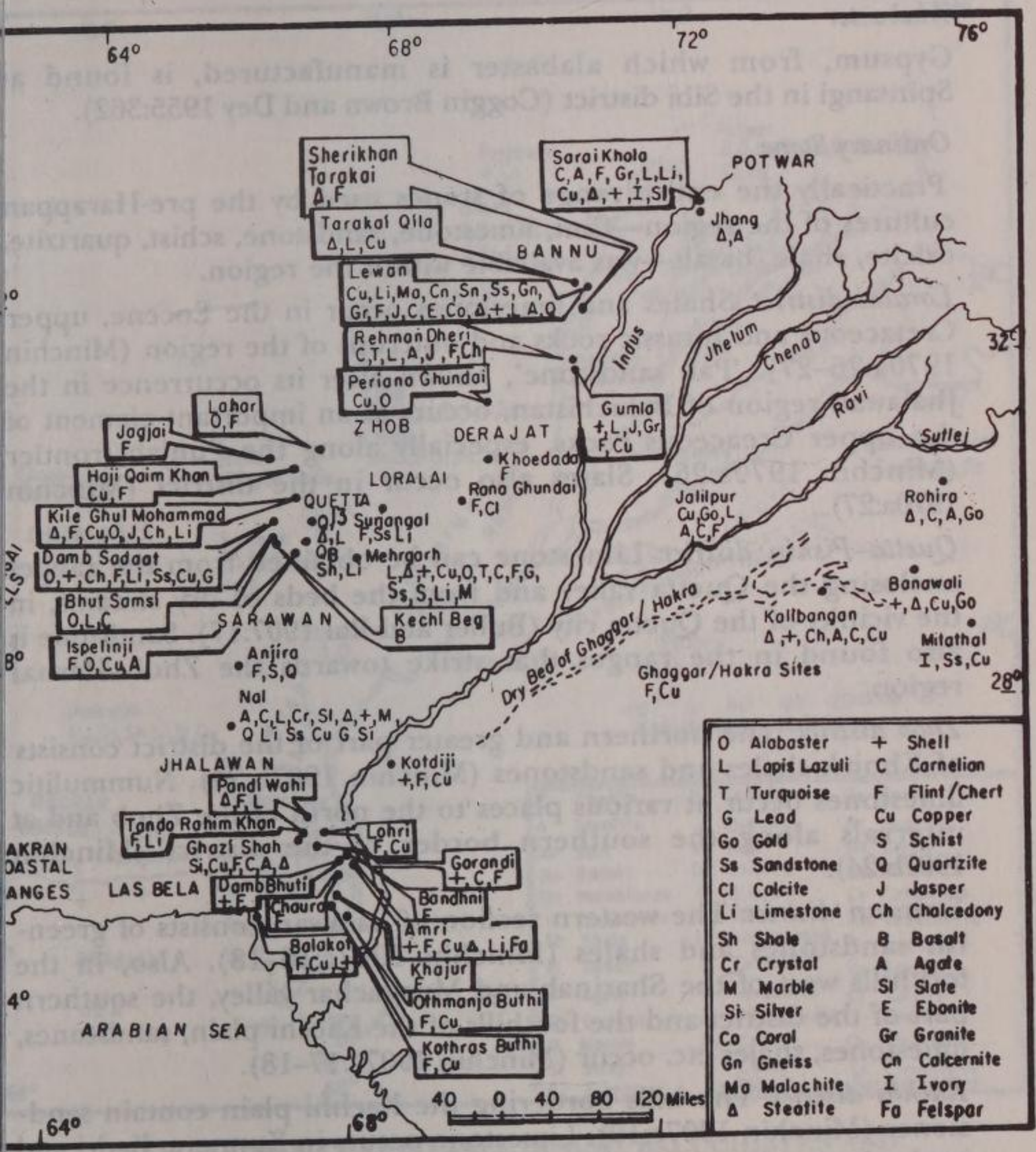
Copper/Bronze: Thirteen fragments of crucibles with metal deposits in them have been found at Mehrgarh (III) (Jarrige 1981:108).

The Raw Materials Found Within the Sub-Region

Steatite

Mughal (1971:194) has mentioned the presence of steatite/talc in

Map 2



SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE CONTEXT OF THE PERIOD BEFORE THE HARAPPAN CIVILIZATION

two localities in the Zhob district; the deposits north of Fort Sandeman were mined in the past.

Alabaster

Gypsum, from which alabaster is manufactured, is found at Spintangi in the Sibi district (Coggin Brown and Dey 1955:362).

Ordinary Stone

Practically the entire range of stones used by the pre-Harappan cultures of the region—flint, limestone, sandstone, schist, quartzite, calcite, shale, basalt—was available within the region.

Loralai district: Shales and limestones occur in the Eocene, upper Cretaceous and Jurassic rocks and outcrops of the region (Minchin 1970a:26–27). 'Pab sandstone', known after its occurrence in the Jhalawan region of Baluchistan, occurs as an important element of the upper Creaceous rocks, especially along the Punjab frontier (Minchin 1970a:26). Slates also occur in the district (Minchin 1970a:27).

Quetta–Pishin district: Limestone can be obtained from the ranges enclosing the Quetta valley and from the beds of dry streams, in the vicinity of the Quetta city (Buller and Rai 1907:17). Sandstone is also found in the ranges that strike towards the Zhob–Harnai region.

Zhob district: The northern and greater part of the district consists of Khojak shales and sandstones (Minchin 1907b:24). Nummulitic limestones occur at various places to the north of the Zhob and at intervals along the southern border of the district (Minchin 1907b:24).

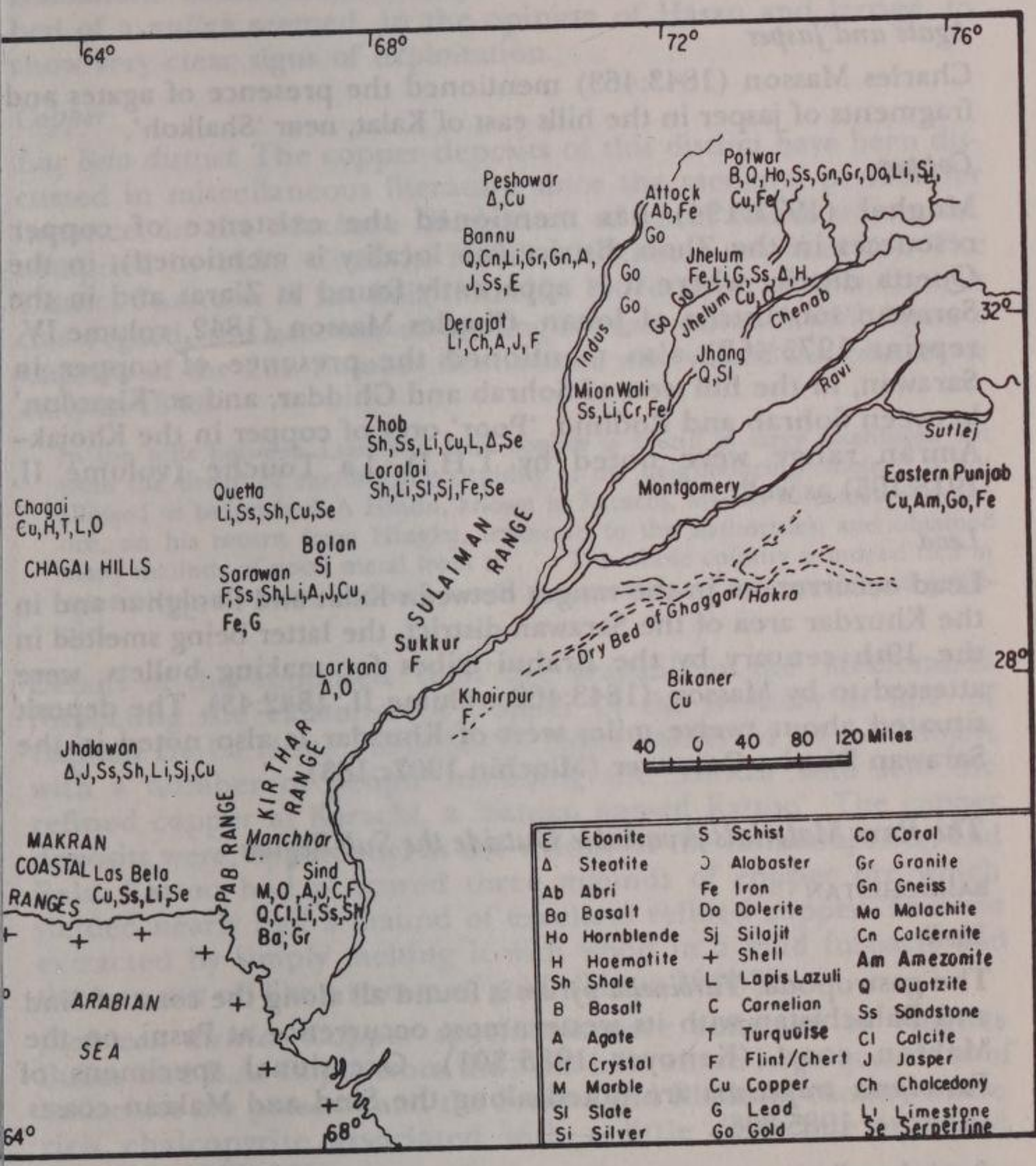
Sarawan district: The western section of Sarawan consists of greenish sandstones and shales (Minchin 1907c:16–18). Also, in the foothills west of the Sharinab and Mangachar valley, the southern part of the district and the foothills of the Kacchi plain, sandstones, limestones, shales etc. occur (Minchin 1907c:17–18).

Kachhi district: The hills bordering the Kachhi plain contain sandstones (Minchin 1907c:10). Limestone occurs in Kunnara, Kadri and in the beds of various hill torrents in Sanni and Shoran (Minchin 1907c:121). Flint/chert boulders are found in the Bolan river which often brings down limestone pebbles as well (Jarrige and Lechevallier 1979:469–70).

Lapis Lazuli

Although no published information is available, the presence of some lapis lazuli in the Zhob district was mentioned by Fazal Dad Kakar, a Pakistani archaeologist working for his Ph.D. on the Zhob

Map 3



RAW MATERIALS AVAILABLE IN SIND, BALUCHISTAN AND REGIONS TO THE NORTH AND WEST OF THE INDUS

area with J.F. Jarrige in Paris (personal communication to D.K. Chakrabarti).

Agate and Jasper

Charles Masson (1843:463) mentioned the presence of agates and fragments of jasper in the hills east of Kalat, near 'Shalkoh'.

Copper

Mughal (1971:194) has mentioned the existence of copper resources in the Zhob district (no locality is mentioned), in the Quetta district where it is apparently found at Ziarat and in the Sarawan sub-district of Johan. Charles Masson (1842, volume IV, reprint 1975:462) also mentioned the presence of copper in Sarawan, in the hill west of Sohrab and Ghiddar, and at 'Kisardun' between Sohrab and Rodinjo. 'Poor' ores of copper in the Khojak–Amran range were noted by T.H.D. La Touche (volume II, 1918:105) as well.

Lead

Lead occurrences in the ranges between Kalat and Panjghur and in the Khuzdar area of the Sarawan district, the latter being smelted in the 19th century by the Brahui tribes for making bullets, were attested to by Masson (1843:462; volume II, 1842:43). The deposit situated about twelve miles west of Khuzdar is also noted in the Sarawan District Gazetteer (Minchin 1907c:163).

The Raw Materials Available Outside the Sub-Region

BALUCHISTAN

Shell

The gastropoda, *Turbinella pyrum* is found all along the coast of Sind and Baluchistan with its westernmost occurrence at Pasni, on the Makran coast (Kenoyer 1985:301). Occasional specimens of *Fascolaria trapezium* are noted along the Sind and Makran coasts (Kenoyer 1985:306).

Lapis Lazuli

The presence of early prehistoric mines of lapis lazuli, copper, turquoise and lead in the Chagai district has been noted by M.U. Hasan (1986:5). The lapis lazuli mines where Hasan and Jarrige were taken by local people, are located at Bi-Bi-Dick, thirty-five miles north of Dalbandin near the Afghan–Pakistan border.

Turquoise

The presence of turquoise in the Chagai district was noted by Hasan (1986:5). The turquoise mines were located at Daraman on

top of the 'Kaboori' mountain, twenty-two miles north of Dalbandin. Some seams of turquoise in a cutting on the side of the bed of a *nullah* seemed, in the opinion of Hasan and Jarrige, to show very clear signs of exploitation.

Copper

Las Bela district: The copper deposits of this district have been discussed in miscellaneous literature since the medieval period (for instance, in the *Mazhar-i Shahjahani* of Yusuf Mirak which was compiled in 1634. Cited in Habib 1982:notes to sheet 5b). The District Gazetteer of Las Bela (Minchin 1907d:118–119) mentions, in this regard, the account of an Englishman called S.V.W. Hart, a Captain of the 2nd Bombay Grenadiers, who visited the country as early as 1840:

> In the hills between Liari and Bela copper is found in large quantities, but from the dread of exciting the cupidity of the neighbouring chiefs, it is not allowed to be worked. A Hindu, known in Karachi, loaded 20 camels with the ore, on his return from Hinglaj, unknown to the authorities, and obtained many maunds of good metal from it. . . . The whole country is indeed rich in mineral productions, and well worth the attention of an experienced geologist.

Details of this supposed 'theft' are available in the 'Memoranda respecting the existence of Copper in the territory of Luz' of Captain De La Hoste (1840:30–3). Hoste conversed on this subject with a number of people including the 'Hindu' who sold the refined copper at Karachi, a 'banian named Kattoo'. The copper deposits were, apparently, in the vicinity of the Kunnaraj river, and Bela. Kattoo had procured three maunds of copper ore which yielded nearly half a maund of excellent refined copper. This was extracted by simply melting it with wood in a mud furnace, and the 'ore ran off like a stream of gold' (Hoste 1840:32).

Jhalawan district: Copper specimens were collected by Hughes Buller and B.A. Gupta from the Wad hills where large quantities of malachite are present, and the Saruna and Khidrani country where rich chalcopyrite associated with a little malachite is found (Minchin 1907c:161).

Chagai district: A detailed account of the copper resources of the Chagai district, provided by E. Vredenberg, is available in the Bolan and Chagai district gazetteer (Buller 1906:127–9). The following deposits find special mention : (a) Ras Koh, south of Charsar in the Kharan state where it occurs as 'chrysocolla' or silicate of copper disseminated through syenite; (b) Lar Koh where it occurs as 'chrysocolla' disseminated through diorite; (c) Robat Koh, Malik-i-Siah Koh and Saindak Koh, where it occurs as carbonate of copper in some veins. Specimens from the Saindak Koh or Sandak copper

mines' have been dated to around 3500–3000 BC (Hasan 1986:5ff). Also, at Robat, near Lar Koh, Vredenberg (cited in Buller 1906:127) noticed significant heaps of slag which were so numerous, that a small fort had been built entirely of them. We are also indebted to Vredenberg for an account of pre-industrial 'chrysocolla' smelting in the Kharan state. Here the silicate of copper was not in veins, but was disseminated in grains of varying size. This however, was quite easily extracted (Buller 1906:127):

> Some men living at Charsar, where there is a little cultivation along a 'karez' remember having seen the metal extracted some 30 years ago, by a certain Dad Muhammad. This man merely collected out of the talus the pebbles containing copper ore, which are conspicuous on account of the green colour which they assume on weathering. These he pounded in a mortar and extracted the metal in a primitive manner, the smelting of chryscolla being very easy.

Alabaster

Oriental alabaster is said to be obtainable in the Chagai district (*Imperial Gazetteer of India* 1908:307).

SIND

Alabaster

Thick beds of gypsum are abundant in the Indus alluvium; Edwin Pascoe (1931:679) mentions occurrences in the neighbourhood of Mohenjo-daro itself. The Kirthar range also contains significant gypsum deposits (Coggin Brown and Dey 1955:362).

Discussion

On the basis of the detailed evidence cited above, we feel that the major communication links of north and central Baluchistan during this period were the following. A major vertical axis was directed to the Surab and Quetta regions from central-south and south Baluchistan, whose cultural complexes—the Nal and Kulli cultures—are clearly exemplified there. This axis may also have been crucial in providing certain categories of raw materials such as shells to inland regions like Mehrgarh. That some copper may also have been procured by north and central Baluchistan from the region to the south, in the light of the impressive copper ore deposits there, especially in Las Bela, is also likely. On its western side, the possibility of the Chagai district being a supply area for lapis lazuli, turquoise, alabaster and copper, in the light of its proximity to the Quetta region, is strong. A horizontal transregional axis from Baluchistan to Sind was a significant element in the interaction pattern of the sub-region with the Kot Dijian complex as well as with the Amri-related sites of Sind. The Amri elements are better

focused in central Baluchistan whereas the Kot Diji elements seem to be concentrated in the north.

South Baluchistan

This region is dominated by Nal and Kulli type settlements. The sites are concentrated mainly in the Las Bela region, which, with the exception of a belt of low broken hillocks on the sea coast, is a perfectly flat plain. A number of sites have also been found in the Jhalawan highland division of the Kalat state, south of Sarawan in valleys of considerable width.

According to the archaeological literature on the subject (Fairservis 1971; Stein 1931, reprint 1982; C. Jarrige 1984; Possehl 1986) the Nal cultural substratum was an earlier habitation level which, at a number of sites was succeeded by the Kulli phase, a part of which was pre-Harappan in nature (see C. Jarrige 1984:129–30). Kulli, which is the largest mound so far discovered in Kolwa, has nothing in its stratigraphy equivalent to the Nal level. Nevertheless Niai Buthi, about three miles to the north-east of Bela and Nindowari in the Ornach valley of south Baluchistan provided evidence of both these cultural levels, the Kulli period following the Nal cultural level.

In the long arid coastal strip running west to the borders of Makran is situated the site of Balakot which was jointly excavated between 1973–7 by the University of Berkeley and the Pakistan Department of Archaeology (Dales 1979, 1981). Period I shows clear links with the Nal phase. In the final two occupational phases of that period, however, the Nal-like pottery was supplanted by the increased presence of Amri-style pottery in contradistinction to the sequence in the rest of the region where the Kulli culture became dominant.

Ceramic and Other Artefactual Links

Central and south Baluchistan show strong stylistic ceramic similarities with the Surab valley, north Baluchistan, and with southern Sind.

The central-south Baluchistan interaction is clearly enunciated by the occurrence of the highly stylized painted animal heads of the Togau C style of Anjira in the lowest levels of Period I at Balakot (Dales 1979:250–1). Niai Buthi, with Togau wares as well as examples of a white painted black slip pottery related to Zari or Kechi Beg white-on-dark ware in its ceramic repertoire is also significant in this regard (Fairservis 1971:190). Other distinctive common elements in the ceramic corpus of Nal and the later cultural levels of central Baluchistan have already been highlighted (p. 14).

Quetta valley designs (of a Damb Sadaat II context) such as spiked trees at the bottom of open bowls, horizontal triangles and diamond motifs, and the use of alternate verticals are found at Mehi (trench I–III) (Fairservis 1971: fig. 54). The bull and bird figurines of Kulli also have parallels in the Quetta sequence (Damb Sadaat III phase) (Fairservis 1971:205). Links can be postulated as far north as the Zhob valley provided one accepts the idea (Fairservis 1971:205) that the terracotta female figurines of the Mehi variety with their goggle eyes, necklaces, shoulder form, pedestal bases and hanging hair represent broadly the same composition as the Zhob mother goddess. In the opinion of Fairservis (1971:205), the incinerary urns that were unearthed by Stein at Mehi and the Incinerary Pot phase at Periano Ghundai are also directly comparable in form and decoration.

The fact that the highly distinctive and closely patterned painted style of Amri was found in Balakot (Dales 1979:250–1) is conclusive proof of south Baluchistan's links with Sind during this period.

The Sitewise Distribution of Raw Materials

The stones, metals and other raw materials exploited by the sites of this zone are clear from a reading of Chart 2. Briefly these are steatite, shell, agate, carnelian, lapis lazuli, crystal, marble, quartzite, slate, limestone, sandstone, chert/flint, copper, lead and silver.

Chart 2

SOUTH BALUCHISTAN—PRE-HARRAPAN PERIOD

Raw Material	*Nal*	*Balakot*
Steatite	seal	
Shell	bangles, beads, fragments	beads, objects
Carnelian	beads	
Agate	beads	
Lapis Lazuli	beads	beads
Ordinary Stone	Crystal pendant. Marble vessel fragment, disc, bead, ringstone. Quartzite grinding stones, grinders. Slate chisel. Limestone weights, celt, ball, rubbers, pounding stones, beads. Sandstone weights, rubbers, pounding stones, beads	Chert/flint chipped stone tools, microliths
Copper/Bronze	chisels, fragments of chisels, bead fragment, adzes, saws, tools, daggers, seal	indeterminate objects
Lead	slag, cerussite specimens	
Silver	finger ring, indeterminate object, foil	

The Evidence of Manufacture of Finished Products at Different Sites

Shell: Two sea shell fragments are reported from Nal (Hargreaves 1929:40).

Beads: The only evidence of bead manufacture is a polished barrel-shaped unpierced stone, pale green in colour (Hargreaves 1929:43).

Lead: A large number of cerrusite specimens (carbonate of lead), as well as the presence of lead slag at Nal (Hargreaves 1929:44) clearly denote local manufacture of lead artefacts. A note has to be made of the fact that, as far as the occurrence of lead in this sub-region is concerned, we do not know if any deposit here contained argentiferous galena from which silver could be extracted.

The Raw Materials Found Within the Sub-region

The presence of lead, copper, and shell in this region has already been discussed (pp. 22, 23).

Agate and Jasper

Among the specimens which were collected by Hughes-Buller and B.A. Gupta, and subsequently identified by the Geological Survey Department were those of agates and jasper, including red jasper from the Wad and Pad ranges of Jhalawan (Minchin 1907c:162).

Ordinary Stone

Limestone, quartzite, and sandstone are among the stones widely available in this region.

Las Bela district: In the hilly regions to the east of the Las Bela plain limestone is widely available especially in the Pab range towards the northern frontier of the state. (Minchin 1907d:13). Sandstones are also found in the Pab range, known as Pab sandstones. West of the alluvial plain of Porali and extending along the Makran coast, calcareous sandstones overlaid by massive white sandstones have been noted (Minchin 1907:14).

Jhalawan district: In this district, calcareous sandstone, as well as nummulitic limestone have been noted (Minchin 1907c:162, 4).

The Raw Materials Available Outside the Sub-region

BALUCHISTAN

The occurrence of lapis lazuli in the Chagai district has already been noted (p. 22).

AFGHANISTAN

Silver

Important silver mines exist at the head of the Panjshir valley in south-east Hindukush, in the vicinity of Herat (Asthana 1982:276). La Touche (volume II. 1918:291) noted that samples of lead ore from an ancient lead mine at Faranjal showed $1^{1}/_{2}$ ounce of silver per ton of lead.

Lapis Lazuli

Lapis lazuli is known to occur in significant quantities in the Kerano Munjan district of Badakshan (Asthana 1982:273). The location of Shortughai, a Harappan settlement, close to the lapis mines of Badakshan is decidedly significant from this point of view as well (Chakrabarti 1990:86).

SIND

Marble

Marble is available in the Kirthar range (see Chart 3).

Chert/Flint

Chert/flint is widely available in Sind, as would be clear from a reading of Chart 3. The best known occurrences are those of the Sukkur and Rohri hills. Incidentally, W.T. Blanford (cited in Flam 1986:71) also noted the presence of flint similar to that of the Rohri hills sixteen kilometres west-northwest of Kotri and a dark brown chert throughout most of Sind Kohistan. These sites seem to have been exploited in the pre-Harappan period (B. Allchin 1979:191) and, since a number of flint knapping sites are also found near many of these occurrences, it is likely that Balakot was procuring chert from this region.

Discussion

The basic orientation of this sub-region was towards north and central Baluchistan on the one hand, and Sind on the other. Significant similarities, however, existed in the ceramic motifs and pottery forms of the Nal and Kulli cultural levels and the Damb Sadaat phase (II–III) in the Zhob, Loralai, Quetta and Surab regions, similarities which in fact extended to other artefactual elements as well such as the Mother goddess figurines which at Mehi are reminiscent of their Zhob counterparts. Since most of the raw materials that were utilized in south and central Baluchistan were available within the sub-region, no raw materials were procured from the regions to its north with the possible exception of some lapis lazuli

Chart 3

SELECT GEOLOGICAL FORMATIONS IN SIND

Name of Geological Formation	*Constitution*	*Principal Exposures*
Manchhar	Lower & Upper beds-grey sandstones with conglomerates. Middle beds-clays with sandstones	Eastern foots of the Kirthar & Laki ranges, Manchhar lake basin, & a section of the Baran river valley
Nari	Thick beds usually grey sandstones	Lower slopes east & west of Kirthar range; valleys between Kirthar, Bhut, Badhra & Laki ranges; valleys of upper Baran, Hab & Kand rivers; most of low ground from Thano Bula Khan to Jungshah
Kirthar	Lower beds—massive white limestone Upper beds—brown & yellow limestone with shale	Kulte-ka-Kabar; many localities along higher slopes of Kirthar range; northern portion of Laki range
	Massive white limestone	Main axis of the Kirthar range
	Massive white or pale coloured limestone nodular in nature, with some shaly intercalcations at base	Sukkur & Rohri hills; ranges of Bhit & Bhadra; northern portion of Laki, western slopes of Daphro & Surjana, Kambhu & Kara; southern termination of Kirthar, Bedur & upper Dambar between Hab & Baran Valleys
	Massive white or pale coloured limestone nodular in nature, with shaly layers at the base	Most of Laki range; eastern scarps of Daphro & Surjana ranges; hills south of Hyderabad; those of Nakli near Tatta & those along railway line from Manjhand to Jhangshahi
	Brown limestones with sandstone, shales & clays	Low ranges east & west of Leilan & east of Banda Vera; neighbourhood of Jerruck
Ranikot	Soft sandstones with shales & clays	Eastern scarp of Laki range from Jhakmari to Ranikot; plain of Leilan
Deccan Trap	Basalt	Some parts of Laki range
Marine Beds of Upper Cretacáous	Olive Shales & Sandstones	Scarp of Laki Range from Jahkmari to near Ranikot including west of Ranikot
Aravalli	Granite	Barrah hill in Laki range; Nangar Parkar hills

from the Chagai district. Lapis, alternatively, could have been procured from Afghanistan since some silver artefacts are also found at Nal whose closest source is also in the same region. Such a trade was undoubtedly mediated by north Baluchistan. That an essential raw material, ie., chert/flint was being procured by coastal Baluchistan from the southern Sind plains is also reasonably certain. In fact, as far as Sind is concerned, it was very much a part of the interregional network of south and central Baluchistan since the fourth millennium BC with Nal and its related sites sharing with the Amri-related horizon a striking similarity in its ceramics. The work of James Cleland (cited in Dales 1979:252–3) on the Balakotian lithics which clearly demonstrates the presence of a common lithic tradition between sites like Balakot, Tharro Hill and Amri, also leaves no doubt on the artefactual similarities between the two regions even before the appearance there of ceramic affinities.

The Indus Sub-Montane Tract

The Indus sub-montane region includes parts of the Salt range and, west of the Indus, the large sections of hills such as the Kohat enclosing the Bannu lowland as well as the Waziristan hills to the west of Derajat. As a consequence of the multi-disciplinary work of the Cambridge Archaeological Mission to Pakistan and the University of Peshawar (F.R. Allchin 1984; B. Allchin 1981; F.R. Allchin and Knox 1981a and b; Khan, Knox and Thomas 1986, 1989; Rendell 1981; F.R. Allchin et al. 1986), about a dozen sites belonging to the early Harappan cultural horizon are known in the Kurram–Tochi doab (information of Farid Khan, cited in Mughal 1981:36), with the three principal prehistoric sites—Lewan, Tarakai Qila and Lak Largai—revealing an integrated culture with two phases: (1) incipient Kot Diji and (2) Kot Diji. The cultural assemblage of the recently discovered site of Sheri Khan Tarakai, however, seems to be distinct, with some ceramic affinities with Mehrgarh (III) (Khan, Knox, Thomas 1986: 16).

Ceramic and Artefactual Links

The Bannu basin shared ceramic and artefactual links with the Derajat region, the Kot Dijian horizons of upper Sind and the Kacchi plain.

A frieze of four fishes on a bowl from Lewan, which represents the side view with both eyes visible on the exposed side is identical to a Rehman Dheri specimen (F.R. Allchin et al. 1986:110). Another frieze from Lewan with two goats and a buffalo-horned head with pipal leaves rising behind the horns can also be generally compared

with the buffalo-horned heads painted on Rehman Dheri pottery (F.R. Allchin et al. 1986:111).

The ceramic links between the Bannu basin and the Ghaggar–Hakra stretch and upper Sind are manifest in the range of forms and painted motifs of Kot Dijian style present at Tarakai Qila and Lewan (Allchin & Knox 1981b:249; Allchin & Knox 1981a:243). One specifically notes the buffalo-horned head found on the Bannu pottery occurring on the side of a Kot Diji pot where it has two flowers emerging from between its horns.

At Sheri Khan Tarakai in the western part of the Bannu basin the use of cross-hatching in pottery decoration and certain animal motifs (cf. goat with curving horns) resembles the style found on the Mehrgarh III wheelmade pottery (Khan, Knox and Thomas 1989:286).

The Sitewise Distribution of Raw Materials

A reading of Chart 4 exemplifies the range of resources exploited at the sites. These raw materials included steatite, shell, lapis lazuli, jasper, carnelian, agate, ebonite, coral, quartz, chert, sandstone, granite, gneiss, igneous rock, limestone, malachite, serpentine, calcarenite, copper and gold.

The Evidence of Manufacture of Finished Products at Different Sites

Shell: Bivalve mollusca shells were noted at Lewan Dar Dariz (F.R. Allchin et al. 1986:271).

Ordinary Stone: Significant evidence for the manufacture of microliths and heavy stone artefacts exists at Lewan Dar Dariz. Blade cores, at all stages of production, blade core trimming flakes and other associated debris such as flakes clearly attest to the manufacture of microliths at the site (F.R. Allchin et al. 1986:67–70). At Tarakai Qila, flake cores, blade cores, blade core fragments, blade core roughouts, and blade core trimming flakes are reported (B. Allchin 1981: 239, table 1). At Lak Largai also, blade cores, blade core fragments and flakes from previously struck cores were noted (B. Allchin 1981:239, table 1). The two kinds of heavy stone artefacts that were undoubtedly manufactured at Lewan were saddle querns, all found in a broken condition probably during the course of manufacture with little or no sign of being worn on the grinding surface, and ringstones which have been found in various stages of completion (F.R. Allchin et al. 1986: 54, 57).

Beads: In an area of approximately 10 x 10 m on the western side of Lewan, the excavators found a wide variety of brightly coloured stones, including fragments of red chert, quartz, types of metamor-

Chart 4

INDUS SUB-MONTANE REGION, POTWAR PLATEAU, UPPER INDUS PLAIN, CENTRAL INDUS PLAINS—PRE-HARAPPAN PERIOD

Raw Material	*Lewan*	*Tarakai Qila*	*Sheri Khan Tarakai*	*Sarai Khola*	*Rehman Dheri*	*Gumla*	*Jalilpur*	*Jhang*
Steatite	beads	seals, vase		beads				
Shell	bangles, beads			bangles		bangles	bangles	bangle
Ivory					Seal			
Semi-Precious Stone	Agate beads, micr-oliths. Jasper mic-roliths. Carnelian nodules			Jasper arrow-head, Carnelian beads. Agate beads	Carnelian beads. Agate beads, mi-croliths. Jasper microliths. Chal-cedony microliths	Jasper bead, core	Agate beads, Carnelian beads	Agate bead
Lapis Lazuli	chips, beads, nodules	beads		beads	bead, lumps	bead	beads, fragments	
Turquoise				beads				

(Chart 4 contd.)

Raw Material	*Lewan*	*Tarakai Qila*	*Sheri Khan Tarakai*	*Sarai Khola*	*Rehman Dheri*	*Gumla*	*Jalilpur*	*Jhang*
Ordinary Stone	Ebonite bead. Quartz hammer. Sandstone palettes, grinding & other heavy stone objects, ringstones. Granite heavy stone objects. Gneiss heavy stone objects, beads. Chert fragments, flakes, microliths, cores, nodules. Igneous rock ringstones, hammers, beads, grinding stones, palettes. Limestone beads, ringstones, nodules. Malachite beads. Calcerenite ringstones. Serpentine fragments	Chert microliths		Chert microliths including nodules, flakes, cores, blades. Granite celts. Limestone chisels, macehead, grinding slabs. Slatestone chisels	Chert blades and other microliths	Granite balls Chert blades, flakes, scrapers	Chert blades, cores	
Copper/ Bronze	rods, sheeting, triangle, fragments	fragments		bangles, ring, pins, needles, spheroid, nail parer		chisels, nail parers, rods	rods	
Gold							bead	
Coral	bead							

phic and igneous rocks, limestone, serpentine and quartzite (F.R. Allchin et al. 1986:181), suggesting their specific use for bead manufacture. Three unpierced beads were noted—one each in quartzite, lapis lazuli and agate (F.R. Allchin et al. 1986:137). In addition, minute awls, drill heads, and a miniature stone hammer were recovered (F.R. Allchin et al. 1986:181). Nodules of chert, quartz, carnelian, limestone, quartzite and lapis lazuli have also been found, as well as lapis lazuli chippings at Lewan V (F.R. Allchin et al. 1986:137).

The Raw Materials Found Within the Sub-Region

Stone

Most of the stone that was present at Lewan, ie., crypto-crystalline silica material such as agate, jasper etc., meta-igneous rocks, as well as harder varieties such as sandstone, limestone, granite, gneiss, calcarenite, and quartzite could have been found in the immediate locality, or within walking distance (F.R. Allchin et al. 1986:63).

The Raw Materials Available Outside the Sub-Region

SIND

The presence of chank shells ie., *Xancus Pyrum*, along the coastline of Sind has already been noted (p. 22).

Coral

Although red or precious coral, *Corallium rubrum*, is gathered mainly from the Mediterranean and its islands, *A Dictionary of the Economic Products of India* (Watt 1989, reprint 1972:529), noted the remarks of W.T. Blanford on the presence of coral in Sind:

> Some miles south of Lohari Lang, and near Murad Khan's 'band' (dam) across the Habb river, a thin bed composed of corals appears a few feet above the base of the Gaj group. This bed can be traced for many miles to the south. All the species of coral (five or six) are encrusting forms or small branching kinds. *A Pachyseris*, or some closely allied form, and two or three species of *Hydnnophora*, are specially common.

Blanford also noted a coral zone abounding in several species of coral near Nari. Watt (1889:531) argued that some of them may have been ornamental types: 'it seems probable that in some of the passages already quoted, reference has been made to coral in a generic sense, some of the forms there mentioned being, strictly speaking, members of the series we have designated ornamental in contradistinction to reef-forming'.

BALUCHISTAN

The occurrences of steatite, lapis lazuli, turquoise and copper in Baluchistan have already been noted (pp. 18, 24).

Serpentine

Serpentine has been found in the Zhob (Minchin 1907:24), Quetta–Pishin (Buller and Rai 1907:17), Loralai (Minchin 1907a:27) and Las Bela districts (Minchin 1907d:14).

NORTH WEST FRONTIER PROVINCE

Two steatite bearing localities are mentioned in *India's Mineral Wealth* (Coggin Brown & Dey 1955:529): (i) at Kangrara in the North West Frontier Province, thirty miles from Abbottabad, there was significant steatite production even till 1948; (ii) in the Nowshera Tahsil of the Peshawar district, there were old pits in altered Attock shales, near Khund, from where the local inhabitants apparently obtained supplies.

AFGHANISTAN

The presence of lapis lazuli in Afghanistan is already noted (p. 28).

Copper

Valentine Ball (1881:265) gave the following account of the deposits in Afghanistan:

> Captain Drummond describes a copper-yielding region between Kabul and Kuram; many of the names which he mentions do not appear on the maps; they are as follows: Moosye, in the pass of Shadkhannee; on the right bank of the Lagur river, west of the village of Kuttasung; in the pass of Silawat, to the east of Kuttasung; Koh-i-chagye; various points in the Silawat Pass; Koh-i-Aeenuk; Seestungee; Baghye; Dundhanee, in the direction of Jowhar, to the south of Rotil-i-Dushtuk; Acoorookhail mountains; Dherband in Gungee Khooshk; Kila Ataye; Tezeen; Khoondurra; Dobundee; Lahazour near Shinkye; Chinakhail; Jerobaee. At all of these localities, which are spelt here as they are in the original, copper ores were found, and at the some of them there are ancient copper mines of considerable extent. The rocks are metamorphic schists, principally hornblendic; it seems doubtful whether the ore exists in true lodes as the courses are parallel to and dip with the bedding. . . .
>
> The most promising veins are said to be those of Dherband and Dobundee, and among the old mines that at Koh-i-Aeenuk holds out the best prospects.

Discussion

The Bannu basin like other contiguous regions (namely the Derajat region and the Potwar plateau) was clearly a part of the Kot Dijian cultural province, a phenomenon which probably first developed and was primarily concentrated in the plains of upper Sind and the Ghaggar/Hakra tract. Full-fledged Kot Dijian horizons exist at Lewan Dar Dariz and Tarakai Qila where a number of pottery forms and ceramic styles are clearly of Kot Dijian inspiration. Shell

and coral from the Sind coastline were also mediated through the Kot Dijian cultural complex. The Bannu basin looked towards the mountainous masses to its north, extending as far as Afghanistan, for a number of raw materials such as copper, steatite and lapis lazuli. Some of these raw materials were also available in Baluchistan but considering that no ceramic types of that region, not even the widely occurring Zhob mother goddesses occur here, it is more likely that the Hindukush lapis mines and the steatite bearing areas of the North West frontier province were being exploited.

Upper Indus Plains—Derajat Region

The Derajat is the only area of the north-west frontier that can be classed as being an integral part of the main Indus valley. It falls into two natural divisions, the *kachhi* Indus valley proper, lying below the present bank of the river, and the *daman*, which takes in the entire tract between the Indus valley and the Suleiman mountains. Although the Dera Ismail Khan Tank road was first explored by Stein (1929b), it is only since the 1960s under the leadership of A.H. Dani that a number of sites, including the type site of Gumla have been systematically studied (Dani 1970–1; Durrani 1981, 1984; F. Khan 1979).

Ceramic and Other Artefactual Links

This sub-region shared ceramic and other links with north Baluchistan and the Sind plains.

Some parallels exist between the pottery of Gumla and the pottery of north Baluchistan as, for instance, in the fragment of a heavy coarse ware dish with arms diverging to the side and with a reddish wash, painted troughs which are of red were and painted cups and saucers all with parallels in the Quetta valley 'Faiz Mohammad' and 'Periano Reserve slip' wares (Dani 1970–1:132; Mughal 1972a:122).

The more definitive links, however, are with the Kot Dijian horizon of upper Sind. In fact, Gumla and Rehman Dheri artefacts, both culturally and chronologically, are related to the Kot Dijian material. Rehman Dheri I itself had some Kot Dijian elements, Rehman Dheri II saw a significant number of typical Kot Diji types and Rehman Dheri III saw the evolved Kot Dijian ceramic elements (Durrani 1984:507). Other sites in the Derajat region also yielded similar cultural material. For instance, at Hathala, a horned deity in black, similar to the horned deity of Kot Diji is depicted on the fragment of a jar (Dani 1970–1:26).

Some of the pottery at Gumla (II to III), revealed panelled sigma motifs, a design which has its highest frequency at Amri IC in south Sind (Shaffer 1978:87).

The Sitewise Distribution of Raw Materials

Chart 4 (pp. 32–33) testifies to the raw materials used in the region. These raw materials are shell, ivory, carnelian, jasper, agate, turquoise, lapis lazuli, chert, granite and copper.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: That the predominant flint microlithic industry at Rehman Dheri was a local industry is evident from the large quantity of flakes, cores and debris which were recovered by Farid Khan (1979:379). At Gumla also, chert/flint flakes have been noted (Dani 1970–1:98–100).

Beads: Rehman Dheri was an important centre for bead manufacture as is evident from the presence there of unfinished beads in lapis lazuli, turquoise, agate, among lumps of raw precious and semi-precious stones (Durrani 1984:509). At least 20 drill heads were recovered in the surface collection itself (Khan 1979:390). One such drill was found intact inside the attempted hole of an unfinished carnelian bead (Durrani 1984:509).

The Raw Materials Found Within the Sub-Region

Ordinary and Semi-Precious Stone

Many varieties of crypto–crystalline silica such as flint, chert, jasper, chalcedony and agate are found in large areas in north and south Waziristan (Khan 1979:379). According to Farid Khan (1979:379), some of the limestone of the Mesozoic and tertiary periods also contains chert which is brought down in the form of river pebbles by the Gomal and Takwara which drain the Gomal plain.

The Raw Materials Available Outside the Sub-Region

BALUCHISTAN

The occurrences of lapis lazuli, turquoise, shell, and copper have already been noted (pp. 20–24).

AFGHANISTAN

The lapis lazuli occurrences are already mentioned (p. 28).

SIND

The presence of shell on the Sind coastline is noted (p. 22).

Discussion

The geographical importance of the Gomal valley as a funnel between north Baluchistan and the Indus plains was manifested as early as the third millennium BC with the presence of the Kot Dijian complex, intermediate between the Baluchi cultural developments and the mature Indus civilization, at both Gumla and Rehman Dheri. Whether this movement of cultural types or ideas was from north Baluchistan to the southern Indus plains or the other way round (Mughal 1971) is not central to postulating the existence of a major interaction zone. What is crucial is that Kot Dijian fabrics, sometimes so similar as to qualify as actual imports, were found in north Baluchistan and there seems no doubt that the presence of a fabric from the Indus plains there was mediated by the Derajat region. A sprinkling of Baluchi ceramic fabrics is also present in this region. Some raw materials that were exploited by Gumla and Rehman Dheri such as lapis lazuli, copper and steatite could have come from Baluchistan also.

Potwar Plateau

The Potwar plateau is an open, undulating country, developed mainly on sandstone formations and mantled by thick deposits of loessic silt which erode easily into deep canyons. Sarai Khola and the small cluster of protohistoric sites related to it are located in the Taxila valley, a couple of miles south-west of Bhir Mound, the first city state of Taxila. In addition to Sarai Khola, which was excavated from 1964 onwards (Halim 1970–71, 1972), two other sites—Jhang (Mughal 1972b) and Hathial (Allchin 1982b)—in this region are noteworthy.

Ceramic and Other Artefactual Links

This sub-region shows ceramic links with the Gomal valley, Jalilpur, upper Sind (including the Cholistan and Ghaggar tract), till the southern Sind plains on the one hand, and the Swat valley on the other. Limited evidence of ceramic links with Kalat is also present.

Full-fledged Kot Dijian contexts are reported from Sarai Khola (Mughal 1971:87–92; Mughal and Halim 1972: 23–89), Hathial West and Jhang (Mughal and Halim 1972:39, 48–50; Allchin 1982b:9; Mughal 1972b:131–2). Among the Kot Dijian types found at Sarai Khola are the flanged vessels, with their lids, short-necked wares

and some pottery specimens with grooved exteriors (Mughal and Halim 1972:39, 48–50). One or two Kot Dijian wares are also present at Pind Nausheri (Mughal 1972b:132). Mughal and Halim (1972:39) have also linked the use of white paint in combination with black at Sarai Khola to the Sothi ware of Kalibangan I.

The Potwar plateau—south Sind ceramic parallels have been postulated on the basis of the presence at Sarai Khola (I) of a handmade ware with applique surface, the primary distinguishing feature being the thick coat of mud, mixed with small particles of stone or fine grained sand on the external surface which resembles the wares found at Amri and contemporary Amrian sites in south-western Sind (Mughal and Halim 1972:43).

The handmade burnished pottery of Sarai Khola (I) appears in a varied form at Jalilpur (I) (Mughal 1972c:7–24), while in Sarai Khola II, examples of the bichrome pottery painted with black-on-brown or black-and-red ware of Jalilpur II have been found (Mughal 1972:121).

Two pottery specimens at Sarai Khola (II) are reminiscent of 'Reserve Slip' ware of Anjira (IV) in central Baluchistan (Mughal and Halim 1972:47).

Towards the north, the interaction of the Potwar plateau and the Swat valley has been discussed by F.R. Allchin (1982b:116) who has found the Sarai Khola I pottery to resemble the earliest pottery of Ghaligai I which is a handmade, sometimes burnished and hard tempered ware. Certain shapes and decorations which usually appear at Ghaligai (II) are also supposed to be similar to that on the dominant pottery of Hathial (Stacul 1984a:210).

The Sitewise Distribution of Raw Materials

A reading of Chart 4 (pp. 32–33) exemplifies the range of raw materials used. These are steatite, shell, lapis lazuli, jasper, carnelian, agate, chert, limestone, slatestone, granite and copper.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: The presence of nodules, flakes and cores at Sarai Khola suggests the local manufacture of microliths (Halim 1972:4). Also, with the exception of one specimen, all the granite maceheads are unfinished, with the central perforation absent (Halim 1972:12).

Beads: One unfinished carnelian bead was found at Sarai Khola (II) (Halim 1972:16).

The Raw Materials Found Within the Sub-Region

Ordinary Stone

The mineral wealth of this region is basically that of the Salt range in which limestone occurrences are numerous (*Gazetteer of the Jhelam District 1883–84* :16), sometimes with an average thickness of 200 feet. The Sarai Khola excavation report also noted the abundant availability in the area of limestone and slate stones (Halim 1972:11), while the Taxila report (Marshall 1951:477) noted the presence of granite in the Tamra *nala*.

Copper

Ball (1881:266) noted in the Salt range, the presence of beds which were called copper shales owing to the presence of small nodules of copper sulphide. These, however, were not of great economic value and Wynne of the Geological Survey of India found no *in situ* nodules. R.D. Oldham (1893:489) also noted that 'some traces of copper in the form of small nodules of copper glance have been discovered in these shales, but these concretions are of rare occurrence'.

The Raw Materials Available Outside the Sub-Region

REGIONS TO THE NORTH AND WEST OF THE POTWAR PLATEAU

We have already noted the presence of flint/chert, jasper, agate, carnelian, steatite etc. in the Waziristan and the Bannu regions (pp. 34–35, 37).

AFGHANISTAN

The lapis and copper occurrences have been already been referred to (pp. 28, 35).

SIND

Shell occurrences on the coast have already been noted (p. 22).

Discussion

The Kot Dijian levels at Sarai Khola, Jhang and Hathial West clearly indicate the presence of an important line of communication between the Potwar plateau and upper Sind, including the Ghaggar–Hakra divide. The ceramic analogies that exist between this area and the Derajat and Jalilpur, going right up to the Sind Kohistan indicate the general direction of this line. Tangible links between Sarai Khola and the Swat valley are also evident. That this northward sweep extended up to the lapis lazuli mines of Afghanistan, which were being utilized by other regions close to the Potwar

plateau such as the Bannu basin, is likely. The nearest steatite deposits to the Potwar plateau also lie to the north, near Abbotabad and in the Peshawar district.

Central Indus Plains

The central Indus plains, physiographically similar to the Punjab plains, are basically made up of alluvium brought down by the Chenab and Ravi rivers. The sole break in this monotonous topography is provided by existing or abandoned river courses. The erratic behaviour of the Indus river over the centuries is reasonably well documented (see Holmes 1968). The Ravi also changed its course frequently—for instance, although the Ravi, until the 14th century went past Multan, it was flowing by the time of the *Ain-i-Akbari* in its present lower bed, the Sidhnai reach, where it met the Chenab well to the north of Multan, not far from the present junction (Habib 1984:2). Jalilpur, incidentally, is located on the former flood plain of the Ravi river in a region which has a pseudo steppic and tropical subdesertic vegetation dependent upon a scanty rainfall (Meadow 1986:45). Although Mortimer Wheeler (1947:91) unearthed potsherds belonging to the early Indus period at Harappa itself, while more recently, J.M. Kenoyer (in a seminar at the Institute of Archaeology, Archaeological Survey of India) discussed the presence of a pre-Harappan level there, the sequence of the central Indus valley is dependent on the published results of the excavations at Jalilpur (Mughal 1972c:117–24), which have yielded pottery going back to the second half of the 4th millennium BC.

Ceramic and Other Artefactual links

Jalilpur (I) shared ceramic traits with southern Sind; the handmade ware with applique surface in Jalilpur I is linked to the similar type in Amri IA and later (Mughal 1972c:119). By period II, the site became more clearly related in its ceramic repertoire with the Kot Diji related horizon of Bahawalpur as exemplified by the presence at Jalilpur of the short-necked, diagnostic Kot Diji vessels, flanged vessels with knobbed covers, among other traits (Mughal 1972:121). A tentative ceramic link with Baluchistan has also been postulated (cf. a few examples of Quetta wet type pottery and comb incised ware at Jalilpur; see Mughal 1972:121–2).

The Sitewise Distribution of Raw Materials

Chart 4 (pp. 32–33) outlines the range of raw materials used at Jalilpur which include shell, lapis lazuli, carnelian, agate, chert, copper and gold.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Chert cores were found at the site (Mughal 1972c:124).

Beads: Unfinished pieces of lapis lazuli are reported (Mughal 1972c:124).

The Raw Materials Found within the Sub-Region

Jalilpur is located in a completely alluvial outwash with neither stone nor metal available within the ambit of the region itself.

The Raw Materials Available Outside the Sub-Region

UPPER INDUS PLAINS

The presence of chert, agate and carnelian in this region has already been noted (pp. 34, 37).

Gold

Alluvial gold occurs in various rivers and streams in this region and has been known to be extracted in the past. The occurrences are as follows.

Attock district: Here gold is found on the banks of the Indus river (*Gazetteer of the Rawalpindi District* 1895:21). In the nineteenth century, the right to extract this precious metal was granted yearly to a contractor, the rate in 1884 being Rs. 120. Apart from the Indus, gold was also found on the banks of other streams like the Raish, Sil and Sohan;

Rawalpindi district: In this district gold is found in the tributaries of the Jhelum and of the Indus (*Gazetteer of the Rawalpindi District* 1895:21). In the nineteenth century it yielded only about Rs. 300 per annum worth of gold;

Jhelum district: Gold occurrences in the old Jhelum district have been noted in the *Gazetteer of the Jhelam District* (1883–4:25): 'Here in the tertiary formations of the Salt Range gold is found in the shape of minute scales. . . . And in the beds of the numerous *nallahs* or *kasis* which flow through the miocene formations, the sand is washed for gold. It seems to be obtained in the largest quantity towards the Indus, north of the Salt Range.' The rivers where alluvial gold is noteworthy are the Bunhar and the Kahari (La Touche 1918:215). In the Bunhar river small quantities of gold from the sands used to yield an annual revenue of Rs. 225 per annum. The Kahari river contained gold in its course below Rohtas and Bakrala.

Copper

Occurrences of copper, apparently 'quite unimportant' are reported from the Salt range in the old Jhelum District Gazetteer (1883–4:30).

SIND

Shell and flint occurrences have already been noted (pp. 22, 28).

AFGHANISTAN

The presence of lapis lazuli is already noted (p. 28).

Discussion

Jalilpur in its early levels shared significant ceramic affinities with the southern Sind plains, the region to which the thick-textured tempered ware of the site belongs. Subsequently, although interaction with Sind was very evident, it was the Kot Dijian fabrics which became dominant. The range of raw materials exploited by Jalilpur were possibly of upper Indus plains origin as, for instance, in the case of semi-precious stones. The strategic position of Jalilpur, on the route to the Derajat and further on to Baluchistan, makes it likely that some resources such as copper and lapis lazuli were being procured from Baluchistan, although the latter was available in Afghanistan as well.

South Sind

The type site of the region, Amri, where a pre-Harappan (we have used the term 'pre-Harappan' interchangeably with 'early-Harappan') level was recognized in its proper context for the first time, and its related sites in southern Sind owe their identification as a distinct group to the work of N.G. Majumdar (1934; Deva and McCown 1949). This cluster is found in the western portion of the lower Indus valley, with many sites along the Kirthar piedmont, south of the Mari–Bugti hills. With a view to expanding Majumdar's work, J.M. Casal (1964, 1979) beginning in 1959, excavated at Amri, carrying his excavations to the basal level in Mounds A and B.

Ceramic and Other Artefactual Links

The sub-region's basic links were with upper Sind and the Ghaggar–Hakra stretch, central and south Baluchistan and north and central Baluchistan.

Kot Dijian pottery types are found at a number of Amri related sites. At Amri itself, a number of Kot Dijian types, along with specific Kot Dijian decorative designs such as the intersecting circle and fish scale designs have been found in Periods IA to IIIA (Mughal

1971:117–18, 85). Kot Dijian parallels are also present at Pandi Wahi (Mughal 1971:118) and Rohel-jo-kund (Mughal 1971:118–19).

The central-south Baluchistan and south Sind interaction is evident from the striking similarities between Amri and Nal wares (cf. Mughal 1971:113) as well as in the occurrence of Kulli pottery elements. Nal pottery has been found at Lohri, Rajo-daro in what has been called an 'unsure stratigraphic context' ie., with both Harappan and Amri wares on the surface, at Damb Buthi, Tando Rahim Khan, Chuti-jo-kund and Rohel-jo-Kund on the surface and at very shallow depths, and at Pandi Wahi and Ghazi Shah stratified here in relation to Amrian and Harappan wares (Deva and McCown 1949:24, 25, 27). Kulli affinities are to be seen basically in the bull motifs executed on some pottery types at Amri related sites such as Ghazi Shah and Pandi Wahi (Majumdar 1934: 82, 94, Pl. XXVI, 12, 22 and 26).

The link with central and north Baluchistan is reflected in the presence of Togau C pottery at Amri, Lohri, Ghazi Shah and Pandi Wahi (Shaffer 1978:87; Casal 1979:102). The similarities in the decorative motifs of some south Sind sites—the lozenges and sigmas at Amri, the arrangement of leaves in columns at Ghazi Shah—and those of north Baluchistan, especially at Dabarkot were pointed out by Majumdar (1934:83). Some Faiz Mohammad grey ware is also present at Amri (Mughal 1971:98).

The Sitewise Distribution of Raw Materials

The raw materials exploited by the sites of this region are evident from a reading of Chart 5. These are steatite, shell, coral, agate, carnelian, limestone, felspar, lapis lazuli, chert, copper and silver.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Chert flakes have been reported from Damb Buthi, Ghazi Shah, Kohtras Buthi, Lohri (where chert cores were also found), Pandi Wahi, Othmanjo Buthi, Khajur, Gorandi, Chauro, Bandhni, and Tando Rahim Khan (Majumdar 1934: 65–67, 103, 105, 107, 114, 120, 122, 125, 134, 135, 141, 165). At Amri, the chert flakes and cores which were found in great abundance on Mound B, clearly suggested to Casal (1964:6) a craft quarter.

Shell: Mussel valves have been reported from Damb Buthi (Majumdar 1934:115).

Beads: An unfinished carnelian bead is reported from Gorandi (Majumdar 1934:85).

Chart 5

SOUTHERN SIND—PRE-HARAPPAN PERIOD

Raw Material	*Amri*	*Damb Buthi*	*Ghazi Shah*	*Gorandi*	*Kohtras Buthi*	*Othmanjo Buthi*	*Khajur*	*Lohri*	*Bandhni*	*Pandi Wahi*	*Chauro*	*Tando Rahim Khan*
Steatite	rod		rings, beads							bead		
Shell	bracelets	bangles, beads		piece								
Lapis Lazuli	beads									beads		
Semi-Precious Stone			Agate & Carnelian beads	Carnelian beads								
Ordinary Stone	Chert blades flakes, cores. Limestone balls. Felspar bead	Chert cores, flakes	Chert flakes	Chert flakes	Chert flakes	Chert flakes, point, knife	Chert flakes, core	Chert flakes & cores	Chert blades & flakes	Chert flakes arrow-head	Chert flakes	Chert flakes Limestone ring stone
Copper/ Bronze	knife blade, scraps, bangle		bead, ring, bangle fragments, sheet, arrowhead, awl crescent shaped object	awl	chisel		piece					
Silver			ring									

The Raw Materials Found Within the Sub-Region

The presence of shell and chert in Sind is already noted (pp. 22, 28).

Semi-Precious Stone

Fairservis (1982:111) categorically mentioned that 'copper, agate, jasper and carnelian are found in the Lyari Hills, the Porali Basin, the Kohistan and the Hab River valley'. Louis Flam (1986:71) relying on Blanford also noted the nodules of quartz and chalcedony in the Lakhi hills and agates as well, although the location of the latter is not mentioned.

The Raw Materials Available Outside the Sub-Region

BALUCHISTAN

The occurrences of steatite, agate, jasper, copper and lapis lazuli have already been noted (pp. 20--24).

Discussion

The southern Sind plains shared a striking number of ceramic traits with the Nal related horizon across the Kirthar range, a region which also provided a number of resources such as copper and agate to it. The emergence of this interaction zone as early as the late fourth millennium/early third millennium B.C is crucial in understanding the subsequent cultural developments in its two regions which in the Harappan urban phase came to be closely intermeshed. Ceramic motifs with north Baluchistan links also exist on the Amri pottery. Two raw materials ie., steatite and lapis lazuli are present in north Baluchistan as well. With the upper Sind region on its east, Amri and Amri related sites shared certain diagnostic Kot Dijian types and since both Kot Diji and Amri are broadly located in the same region, this interaction is perfectly in order. Furthermore, Amri ceramic traits which are found in Jalilpur and the Potwar plateau could only have reached there after moving through upper Sind.

Upper Sind and the Ghaggar–Hakra System

Although a part of the old bed of the Ghaggar–Hakra river was first explored by Stein in 1941 (1942), and subsequently by A. Ghosh (1953), it is from 1974 onwards, in a series of field surveys undertaken by the Pakistan Department of Archaeology under the direction of Mughal, that an astonishing number of sites from the pre-Harappan to the post Harappan periods have been revealed (Mughal 1981, 1982). The type site of Kot Diji probably represented

the southern extremity of the zone. The definitive excavation of this site is that by. F.A. Khan (1965). This pattern seems to extend across the border into India. K.F. Dalal (1980, 1981) recovered pottery identical to the Hakra wares at RD 89 in Anupgarh tahsil. The fabrics of Kalibangan are akin to the early Harappan pottery of the Cholistan region in various aspects as well.

Ceramic and Other Artefactual Links

In the Hakra wares period, this sub-region shared the strongest ceramic traits with southern Sind and less significantly, some affinity with north Baluchistan. The subsequent early Harappan phase marked the crystallization of the now famous Kot Dijian horizon, a cultural complex which became manifest over a vast stretch from Baluchistan to Haryana.

The 'mud applique' were, which is the most frequent and conspicuous pottery type of the Hakra wares period, is said (Mughal 1982:90) to bear a strong resemblance, in both vessel form and surface treatment, to some of the handmade pottery from the earliest levels of Amri IA where it is dated to the first half of the fourth millennium BC. There are also close parallels in design and fabric between some sherds of Sandhanwala Ther (of cream fabric with various geometrical designs in brown) and Amri ware (cf. Dalal 1980:20). At Kalibangan, the shape and design of the basins in Fabric D are closely paralleled with Amri IIB (2450 B.C.) (Thapar 1979:198).

The black slipped red pottery of the Hakra Ware period, has been supposed by Mughal (1982:90) to have parallels with Periano A ware from the Zhob valley. The surface treatment of Fabric B at Kalibangan, in the opinion of B.K. Thapar (1979:197), also recalls the so-called 'wet wares' including the Khojak parallel striated style of the Quetta valley. In the opinion of Mughal (1971:101, footnote 140), however, parallels between Baluchistan and Kalibangan do not seem valid.

The Sitewise Distribution of Raw Materials

Chart 6 clearly exemplifies the range of raw materials utilized. These are steatite, shell, chalcedony, agate, carnelian, chert and copper.

The Evidence of Manufacture of Finished Products at Different Sites

Although no details are available, during the early Harappan period, 35 per cent of the sites in the Bahawalpur region were mul-

Chart 6

UPPER SIND, GHAGGAR–HAKRA DIVIDE, PUNJAB AND HARYANA—PRE-HARAPPAN PERIOD

Raw Material	*Kot Diji*	*Ghaggar–Hakra sites*	*Kalibangan*	*Banawali*	*Rohira*	*Mitathal*
Steatite			beads	beads	beads	
Ivory						pin
Shell	bangles, beads	bangles	beads, bangles	bangles		
Semi-Precious Stone			Chalcedony & Agate blades. Carnelian & Agate beads	Agate & Carnelian beads		
Ordinary Stone	Chert blades, cores, scrapers, microblades, cores	Chert flakes		Sand-stone ball		
Copper/ Bronze	ring, bangle fragment	ore fragment	rods, rings, wire pieces, lumps, pins, arrowheads, celts, beads, axe, bangles	implements, bangles	frag-mentary bangle	
Gold				beads	foil	

tifunctional settlements ie., a combination of residential functions with specialized industrial activity (Mughal 1982:91).

Ordinary Stone: Cores including microblade cores as well as chert flakes have been reported from Kot Diji (Khan 1968:82,B.Allchin 1979:191). The occurrence of chert flakes in sites of the Ghaggar Hakra region has been noted by Mughal (1971:176) although no specific site has been mentioned.

The Raw Materials Found Within the Sub-Region

Copper

The presence of old workings of copper in the Bikaner state has been noted by K.D. Erskine (1909:351), at Bikramsar and Bidasar. James Todd's remark on the profitability of the mines was mentioned by Erskine—the first mine, in the opinion of Todd, did not repay the expense of working, while the second was almost exhausted after having been worked for nearly thirty years.

Chert

Less than half a kilometre away from Kot Diji, chert occurrences as well as some worked flakes were noted by B. Allchin (1979:191).

The Raw Materials Available Outside the Sub-Region

SIND

The occurrences of chert and shells have already been noted (pp. 22, 28).

RAJASTHAN

Copper

The copper mineralization in Rajasthan is probably one of the most extensive that exists in India and is found in almost all areas in the state. Detailed accounts of these copper deposits are available in a number of works (Agrawal 1971; *The Rajputana Gazetteer* 1879, *The Wealth of India II* 1950). We have depended on the documentation done by the Geological Survey of India entitled 'Exploration for Copper, Lead and Zinc Ores in India' (Raghunandan et al. 1981). Chart 7 contains details of the various mineralized belts in Rajasthan, the nature of deposits and the presence of old workings.

Unfortunately, although the copper reserves and old workings of Rajasthan were known and exploited from an ancient period there is a great paucity of scientific dating. Regrettably the available radiocarbon dates for Khetri are only medieval. Recently, six copper-ore mining and smelting sites were investigated for lead isotope dating in the Aravallis although the results are not available as yet (Hegde 1985:100–9). Hegde (1985:102) also reported the dating of timber supports from a gallery set at a depth of 120m at the Rajpura–Dariba mines in the Udaipur district; the radiocarbon date is 3120 B.P. ie., the last quarter of the second millennium BC.

Agate and Carnelian

Pascoe (1931:681–2) noted the presence of conglomerates of agate in Rajasthan.

Steatite

The localities of Dogetha, Gisgarh and Morra are steatite bearing (Pascoe 1931:678). Sendra, Chitor and Gudas in north-western Rajasthan also contain thin bands of talc schist (Pareek 1984:73).

Discussion

Upper Sind and the Ghaggar–Hakra stretch, from the beginning of settled village life there, was part of a larger trade and communication axis. In fact, since the Hakra wares period in the Cholistan tract, a mud-applique ware closely related to the Amri fabric was noted, a fabric which incidentally shows an interregional distribution that includes Jalilpur and Sarai Khola. By the early Harappan period, elements of the Kot Dijian horizon of this cultural province

Chart 7

COPPER DEPOSITS OF RAJASTHAN

Sr. No.	*Deposit*	*Location*	*Lode Character*	*Evidence of Old Workings*
1.	*Khetri Deposit* (Madhan Kudhan)	Jhunjhunu dist.	Pyrrhotite Chalcoprite Pyrite	extensive old workings with large mine dumps over length of 1.5 kms
	Kolihan	Jhunjhunu dist.	Pyrrhotite Chalcoprite Pyrite	number of old workings
	Kalapahar	Jhunjhunu dist.	Pyrite Pyrrhotite Chalcoprite	old workings (450 m)
	Kolihan	Jhunjhunu dist.	Pyrrhotite Pyrite	old workings (900 m)
	Deoro	Jhunjhunu dist.	Chalcoprite Pyrrhotite Pyrite	old workings (210 m) and small slag heaps
	Papurna	Jhunjhunu dist.	Pyrrhotite Chalcoprite Pyrite	group of old workings at Badawali
	Dholamala	Jhunjhunu dist.	Chalcoprite Pyrrhotite Pyrite	60 workings (450 m)
	Usri	3.5 km S.E. of Of Khetri town	Pyrite Chalcoprite Pyrrhotite	20 old workings (800 m) (gold workings?)
	Rampur	Jhunjhunu dist.		old workings with minor slag dumps (150 m)
	Taonda	Jhunjhunu dist.		old workings (600 m)
	Malwali	Jhunjhunu dist.		old workings
	Bokhri	Jhunjhunu dist.		small pits (1.5 km)
	Sheopuragarh	Jhunjhunu dist.		3 small old workings
	Kakrana	Jhunjhunu dist.		old workings
	Naori	Jhunjhunu dist.		small old workings
	Ponk	Jhunjhunu dist.		impressive old workings
	Satkuri	Jhunjhunu dist.		old shafts & open pits
	Goria	Jhunjhunu dist.		narrow old shafts
	Dhanota	Jhunjhunu dist.		impressive old workings
	Nangal	Jhunjhunu dist.		shallow old pits
2.	*Nim-Ka-Thana Belt* Baleswar	Sikar dist.	Chalcopyrite Pyrite Pyrrhotite	developed old workings, scattered slag, mine dumps, well planned old mining colonies
3.	*Alwar-Jaipur Belt* Baldeogarh	Alwar dist.	Pyrite Chalcopyrite	old workings
	Nalladeswar	Alwar dist.	Pyrite	old workings
	Kalajoda	Alwar dist.	Pyrrhotite Chalcopyrite	number of shafts with large slag dumps
	Pratapgarh	Alwar dist.	Pyrite	old workings consisting
	Matasula	Alwar dist.	Pyrrhotite	of old shafts, jold workings
	Gol-Badshahpur	Jaipur dist.	Chalcopyrite Bornite	(2 km) with mine dumps and slag heaps
4.	*Lalsot-Nithor Khansera Belt* Khankhera	Bharatpur dist,	Chalcopyrite Pyrite	old workings
5.	*Jahazpur Belt* Jhikri-Amargarh Back			old workings

(Chart 7 contd.)

Sr. No.	*Deposit*	*Location*	*Lode Character*	*Evidence of Old Workings*
6.	*Western Copper Zone* Devpura-Benera		Chalcopyrite Pyrrhotite	number of old workings
	Pur-Dariba			2 major old workings –Dariba main pit & parallel trench, with slag heaps
	Gurla	Bhilwara dist.		old workings & some slag heaps
7.	*Jasma-Rewara-Karor Belt* Rewara	Chittorgarh dist.	Chalcopyrite Pyrite	Shallow depressions, many of them narrow vertical shafts
8.	*Kalahudi-Bethumni Zone* Satdhudia	Bhilwara dist.		series of old workings
9.	*Wari-Bhopalsagar-Akola Zone* Wari	Chittorgarh dist.	Chalcopyrite Pyrrhotite	chains of old workings with mine dumps& slag heaps (1.8 km)
	Akola (Dariba)	Chittorgarh dist. near Akola vill.	Pyrite	few old workings with small slag heaps and mine dumps
10.	*Banswara Belt* Jharka	23 45': 74 25'	Chalcopyrite	3 zones of old workings viz., eastern, western, & northern (1.47 km, 1.2 km, & 2.5 km respectively)
11.	*Delawara Belt* Karoli	Udaipur dist.	Chalcopyrite	extensive old workings including shafts (1.8 km)
12.	*Dungarpur Zone* Padar-ki-Pal	Dungarpur dist.	Pyrite Bornite Chalcopyrite	old workings & slag heaps
	Amjhara	Dungarpur dist.	Chalcopyrite Bornite	old pits with mine dumps
13.		Bikaner dist.		old workings at Bikramsar and Bidasar

were present in Baluchistan, the upper Indus plains, the Potwar plateau, and lower Sind. The imposing pre-Harappan sites of this region like Kalibangan and Gamanwala Ther (which, incidentally is larger in area than both Rehman Dheri and Kalibangan) are also suggestive of interregional trade. For instance, at Kalibangan the large number of copper/bronze artefacts which have been found were manufactured in all probability from copper procured from Rajasthan (Agrawala 1984:159–60). The Kalibangan shell artefacts could have been Sind imports.

Punjab and Haryana

This region, known as the Indo–Gangetic divide is really transitional between the Indus and Ganga deltas and corresponds broadly to the area between the Sutlej and Yamuna. Siswal, Mitathal (Bhan 1971–2, 1973, 1975) and Banawali (Bisht 1978, 1987: Bisht and Asthana 1979) are among the important sites with pre–Harappan levels. A fresh interpretation of the existing evidence has been offered by Shaffer (1981, 1986).

Ceramic and Other Artefactual Links

The ceramics of the Punjab and Haryana sites ie., Mitathal, Siswal, Sarangpur etc. indicate a cultural affiliation with Kalibangan. At Siswal A, the motifs and vessel forms were similar to those found at Kalibangan I, Fabrics A, B and D. Rakhigarhi ceramics have also been compared to Kalibangan (I) with all the fabrics of the latter being present there (Bhan 1975:96). At Banawali, the ceramic inventory records all six Kalibangan fabrics, including the methods of surface dressing (Bisht 1982:115). At Mitathal (I), the pottery is mainly represented by Fabrics A and C along with the others, albeit, in insignificant quantity, of the Kalibangan I ceramic tradition.

The Sitewise Distribution of Raw Materials

Chart 6 (p. 48) outlines the raw materials used at the site. Briefly these are ivory, steatite, shell, agate, carnelian, sandstone, copper and gold.

The Evidence of Manufacture of Finished Products at Different Sites

Gold: At Rohira, Sangrur district, Period IA yielded a gold foil near an oval shaped furnace which seemed to be a goldsmith's house (*I.A.R.* 1982–3:65–6).

The Raw Materials Found within the Sub-Region

Copper

In the relevant *Wealth of India* volume (1950:319), an occurrence of copper in the Patiala district is reported although it is also mentioned that nothing much is known about it.

Details of the copper occurrences in Haryana are available in the *Bulletin of the Geological Survey of India* (No. 47, Raghunandan et al., 1981:188–9). The areas where surveys for copper have proved successful are:

Region between Khetri and Khodana: In this region, mineralization occurs in the Khodana West Block, the Dhani Umrabad area and the Narnaul region. Old workings have been noted in both the Khodana West Block and in the Narnaul area—in the latter area, ancient copper workings with mine spoils were found scattered over a length of 8 kilometres from Dhani–Umrabad to the Khalra hills and also in the Teejanwali and Luni hills;

Golwa–Gangutana area: In this region of the Mahendragarh district, mineralization has been traced over a strike length of over 4.5 kilometers where it varies from 4 to 40 metres in width;

Tosham: In this region, six bands of copper mineralization, with a copper content between 0.64 per cent to 2.5 per cent, have been identified by drilling.

Gold

Insignificant quantities of alluvial gold are found in:

Ambala district: The *Gazetteer of the Ambala District* (1892–3:14) mentions the presence of gold in minute quantities in the sand brought down by the hill streams, especially those of the old Khara tahsil.

Hoshiarpur district: Gold is found in minor quantities in Hoshiarpur in the bed of the Sohan river among other streams (*Gazetteer of the Hoshiarpur district* 1983–84:9). Professional gold washers called *dhaola* used to earn a meagre sum of about three annas *per diem* from it.

The Raw Materials Available Outside the Sub-Region

RAJASTHAN

The occurrences of copper, steatite and a number of semi-precious stones such as agate, carnelian etc. have already been mentioned (pp. 49–51).

SIND

Shell

The shell occurrences have already been noted (p. 22).

Discussion

The primary interaction of Punjab and Haryana was with the sites of the Ghaggar–Hakra divide as exemplified by the ceramic traits it shared with Kalibangan. In fact, till recently, the reference point of these cultures was the Kalibangan sequence. That some marine shells came from the Sind coast to the sub-region is also possible. At the same time, certain basic raw materials such as steatite, and

cryptocrystalline silica stones like agate and jasper were being procured from Rajasthan.

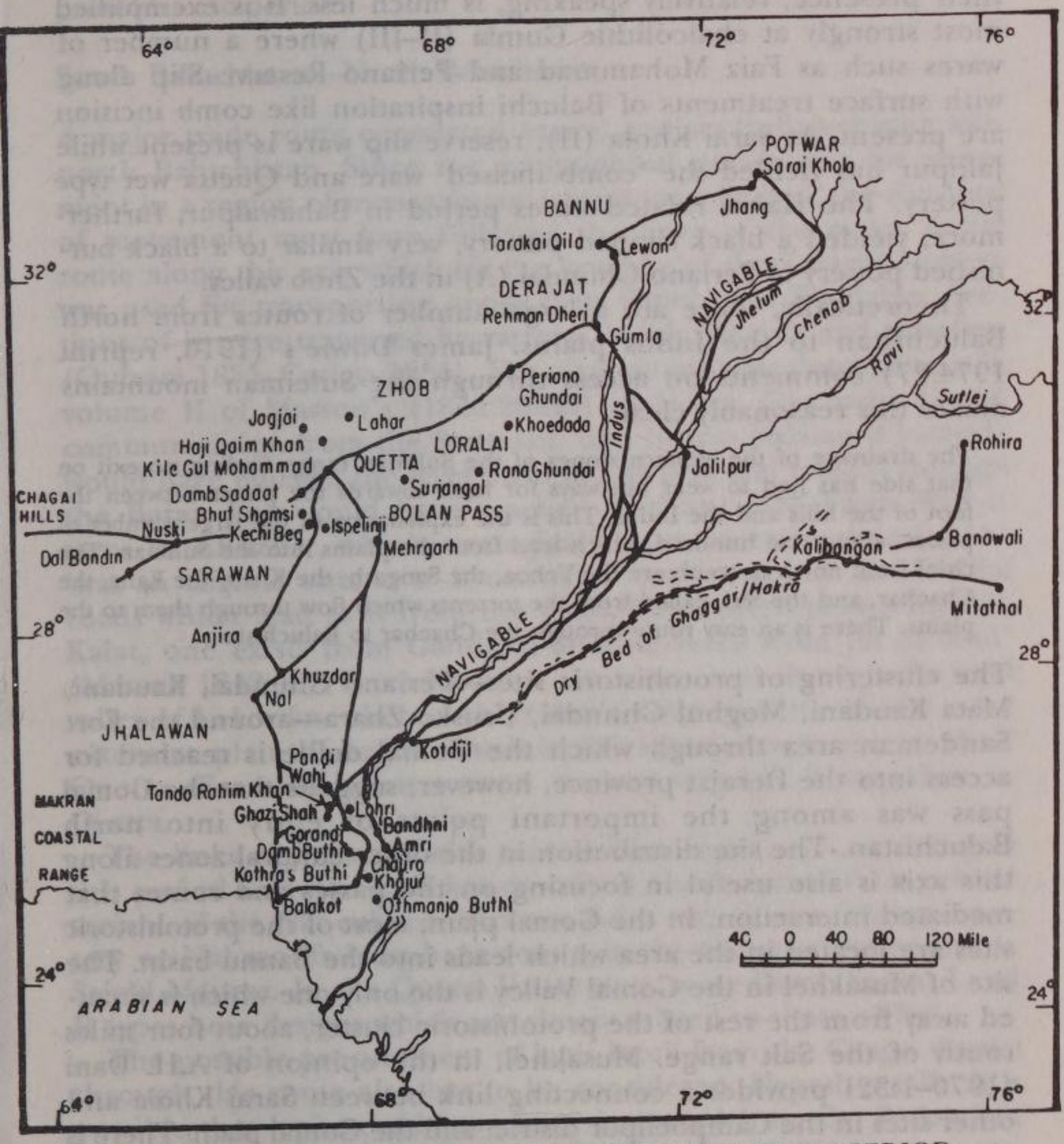
INTERNAL TRADE ROUTES

Sind—Upper Indus Region—North Baluchistan

Among the most significant directions of movement in this period was that from the Sind plains through the central Indus plains to the Derajat region where the Gomal defile provided access to north Baluchistan. The Derajat region, the southernmost of the five districts on the western side of the Indus, and the Gomal pass, which divides Waziristan from the Zhob region have been of abiding importance, acting as funnels for movement from the Loralai and Fort Sandeman area on the one hand, and for the movement of goods, traditionally carried by the Powindah *Kafilas* between the north-west, Afghanistan and Central Asia on the other. From the Derajat, one line through the Gomal pass followed the lateral valleys of the Zhob basin to reach north Baluchistan, while another route, going along the present Dera Ismail Khan—Tank road reached Bannu.

The major archaeological indicator of interaction along this route is the distribution of Kot Dijian pottery. The diagnostic Kot Dijian types found in north Baluchistan are those designated as subtypes II, IX, XIV and XIII in M.R. Mughal's classification of this early Harappan group of pottery. Many of the examples in the Zhob and Quetta valleys seem to be actual imports. In the Derajat region, the Rehman Dheri assemblage has been delineated on the basis of Kot Dijian elements in three periods. Higher north, the Potwar plateau, to the east of Derajat and the Bannu basin were also linked to this axis. The Potwar plateau has yielded Kot Dijian pottery at Sarai Khola, Jhang, Hathial West and Pind Nausheri. The Bannu basin sites of Lewan Dar Dariz and Tarakai Qila have yielded certain forms and painted decorations which, in the opinion of the excavators, are similar to those of Kot Diji. The Bannu basin—Derajat—Sind interaction is also clearly exemplified in the friezc depicting a horned deity which is very much a part of the corpus of iconographic symbols of the early Indus and mature Harappan periods, and has been found on the pottery of Lewan, Rehman Dheri and Kot Diji. Lower down, and very much within this axis is the central Indus plains site of Jalilpur where diagnostic Kot Dijian globular-shaped ware and flanged vessels with knobbed covers have been found.

Map 4



INTERNAL TRADE ROUTES IN THE CONTEXT OF THE PERIOD BEFORE THE HARAPPAN CIVILIZATION

Baluchistan ceramic types also occur along this axis although their presence, relatively speaking, is much less. It is exemplified most strongly at chalcolithic Gumla (II–III) where a number of wares such as Faiz Mohammad and Periano Reserve Slip along with surface treatments of Baluchi inspiration like comb incision are present. At Sarai Khola (II), reserve slip ware is present while Jalilpur has yielded the 'comb incised' ware and Quetta wet type pottery. The Hakra related wares period in Bahawalpur, furthermore, yielded a black slipped pottery, very similar to a black burnished pottery of Periano Ghundai (A) in the Zhob valley.

Theoretically, there are a large number of routes from north Baluchistan to the Indus plains. James Dowie's (1916, reprint 1974:27) comments on access through the Suleiman mountains makes this reasonably clear:

> The drainage of the western slopes of the Suliman range finding no exit on that side has had to wear out ways for itself towards the plains between the foot of the hills and the Indus. This is the explanation of the large number of passes, about one hundred, which lead from the plains into the Suliman. The chief from north to south are the Vehoa, the Sangarh, the Khair, the Kaha, the Chachar, and the Siri, called from the torrents which flow through them to the plains. There is an easy route through the Chachar to Baluchistan.

The clustering of protohistoric sites—Periano Ghundai, Kaudani, Mata Kaudani, Moghul Ghundai, Urusko Zhara—around the Fort Sandeman area through which the Gomal defile is reached for access into the Derajat province, however, suggests that the Gomal pass was among the important points of entry into north Baluchistan. The site distribution in the other cultural zones along this axis is also useful in focusing on the passes and routes that mediated interaction. In the Gomal plain, most of the protohistoric sites are located in the area which leads into the Bannu basin. The site of Musakhel in the Gomal Valley is the only one which is situated away from the rest of the protohistoric cluster, about four miles south of the Salt range. Musakhel, in the opinion of A.H. Dani (1970–1:32) provides a connecting link between Sarai Khola and other sites in the Campbellpur district and the Gomal plain. There is also another route to the Salt range and the Potwar plateau from the Jhang district where the Chenab could be crossed to reach the Jhelum which was then followed to the Potwar plateau; incidentally, the Jhelum was a navigable river and Punjab salt used to be exported to Multan and Bahawalpur by it. Whether it was mediating traffic between the Salt range and the Central Indus plains where Jalilpur shares the same intrusive ceramic types as Sarai Khola (namely Amri-related mud applique ware and Kot Dijian subtypes) is not certain since the intervening region has not revealed any early Harappan horizons; nevertheless, considering the ease of

communication through this route, it may have been used in the protohistoric period.

South Baluchistan—North Baluchistan

A major trade route connected coastal and south Baluchistan with north Baluchistan. Since the geographical possibilities for movement in a region of mountainous terrain were limited, the direction of movement must have followed the lines of the major *kafila* route along this axis which till the opening of the Karachi harbour was used for transporting goods from Bombay to Kandahar. Sec- was used for transporting goods from Bombay to Kandahar. Sections of it were traversed by various British officials and travellers (Outram 1855; Carless 1855). The clearest available description is in volume II of Masson's (1842:20–49) memoirs. The main line of communication from the Sonmiani bay, (where Balakot is located) would have entered the level plain of Las Bela and passing through the Baran Lak would have reached Wad and Nal. From Wad it went to Khuzdar, which strategically as a communication node 'was an eligible one, as to it converge many roads. . . .Besides the roads which lead to it from the coast, the western provinces, and Kalat, one exists from Gandava; another leads from Jui in Sind' (Masson 1842:43). From Khuzdar the route went through the level valley of Lakorian, where a short defile connected it with the more extensive plain of Anjira which is 234 kilometres to the south of Quetta. From Kalat, it wound its way through Mangachar to Quetta.

The links of Jhalawan with central Baluchistan were so strong in this period that de Cardi has described Surab Period IV as a local variant of the Nal culture. Between Kalat and Quetta, Nal-type pottery or Nal motifs have been found in the Chappar Valley and at Saiyid Maurez. In the Quetta Valley sites, some Damb Sadaat I and II types bear designs which are closely related to those of Nal.

The possible procurement of lapis lazuli from the Chagai district through this route also has to be considered. Hypothetically, it is possible that lapis could have been imported from the Badakshan region or even from the Zhob valley. However, if this was the case, the complete absence of lapis artefacts in the archaeological record of the Zhob and Loralai regions does not stand to reason. On the other hand, the distribution pattern of lapis lazuli artefacts in Baluchistan clearly suggests the possibility of a Chagai source. Lapis lazuli artefacts are found at Q 13 (on the Quetta–Sibi road), and Mehrgarh in the north, at Bhut Shamsi and Nal in central-south Baluchistan and at Balakot on the coast. There thus seems to have been an axis from Chagai through Quetta, from where one route went through the Bolan to the Sibi plain, to Kalat and down to

south Baluchistan, along a route which was also mediating other linkages between them.

By the Kulli phase, however, the orientation of the route had changed dramatically with no Kulli links evident in the Surab region. Kulli afinities did exist with the Zhob and Quetta valleys, but the route of communication was undoubtedly a changed one.

Sind—Central and South Baluchistan

The cultural links of Sind Kohistan as well as of the adjacent Kirthar piedmont with the central and south Baluchistan country were sharply focused in the pre-Harappan period. Among the more important routes was that which followed the Mula river from the Kach Gandava plain through the Mula pass. Masson (1842:120) summed up some of the main advantages of this route: 'The Mulloh route, if there existed any important commercial communication, which there does not, between Kalat and the countries to the east, would be of much value. It is not only easy and safe, but may be travelled at all seasons, and is the camel route through the hills intermediate between Saharawan and Jhalawan, and Kachi, from the latitude of Shall'. From Nar, there was a bifurcation with one branch going south-west to Khuzdar, the other joining the main Quetta–Khuzdar route near Anjira. There were other connecting links as well. Lambrick (1964:65–6) describes two such routes. The first route, by climbing the Musefari lak over a low offshoot of the Kirthar, led into the valley of the Loi Nai. From there, across the Garre pass in the main Kirthar range, it descended towards the Lake Manchar region. This route was used even in the middle of the present century for the transportation of *pish* (dried leaves of the dwarf palm used for flooring and house construction in the Indus valley) and for seasonal migration in and out of Sind by the Brahui nomads. The second route which, according to Lambrick, is easier and more direct, passed out of the Saruna valley, and crossing the Hab river, ran down the left bank past Diwana. It then crossed over to Beli Thap and at Taung entered the upper valley of the Baran Nai and the southern portion of Sind Kohistan. This is frequented by camel caravans bringing down *pish* from Jhalawan into lower Sind; it is in fact known in Sind as the *Pish Wat.*

Interaction along these routes is evident from the occurrence of Nal wares along many sites on the routes and in the Sind region. Two sites in the vicinity of the Mula pass have yielded Nal sherds on the surface. The Kirthar piedmont is also studded with sites—Lohri, Rajo-daro, Rohel-jo-Kund, Damb Buthi, Pandi Wahi and Ghazi Shah among others—bearing stratified and unstratified Nal sherds. At a site on Diwana (Fairservis 1971:168), a local variation of the Nal ceramic tradition has been found. The Saruna valley has

yielded a number of *gabarbands* (Fairservis 1971:168–9), the beginnings of which are dated to the Nal period. In the opinion of Fairservis, it is likely that explorations in the Saruna valley through which an important route from Sind to Jhalawan passed, would yield Nal ceramics. Flam's work (1984:77–82) on the paleogeography and prehistoric settlement patterns of the lower Indus valley lends further credence to the significance of this route. Out of the sixty-one prehistoric sites in Sind, about half of them were in Sind Kohistan, with the first phase yielding Nal ceramics.

Amri ceramic presence in the Mula pass sites suggests that the Mula route provided access from south Sind into the Surab region, an area with which Amri affinities are strongly exemplified both in the surface treatment and style of painting. The sand-slipped pottery of Siah Damb, the red-slipped bichrome ware which contains a number of elements found in the Amri ware as well as certain kinds of painting and motifs which are similar to those in Amri IA and B pottery are some such examples. The presence of copper/bronze artefacts at Amri, Ghazi Shah, Kohtras Buthi, Othmanjo Buthi and Khajur also underlines the fact that copper was procured from the central-south Baluchistan region, since this resource is absent in the south Sind.

In the Kulli cultural phase, the Kirthar piedmont mediated the traffic between the Kolwa stretch of Baluchistan to the Kacchi tract and northern Baluchistan. Kulli affinities with Ghazi Shah and Pandi Wahi are basically in the rendering of certain bull motifs. Higher up in the Kacchi plain and the Bolan plateau, the affiliations with Kulli are fairly clear in certain painted patterns (cf. bull designs). Similar affiliations are also to be seen in the Quetta valley. It is also likely that the Zhob mother goddess figurines which were produced by the hundreds at Mehrgarh came to influence their Mehi prototypes as a part of the general interaction which is clear from the ceramic affinities.

Coastal Sind—North Baluchistan

This axis used to be an important *kafila* route in the early nineteenth century. Its description is available in Masson's narrative (1843:411) on Kalat.

The coastal traffic to north Baluchistan passed through Kohistan where Amri was undoubtedly a significant node. Majumdar, in fact, proceeding along this route, running due south through the Kohistan from the Manchar lake to the point where the Baran Nai enters the place, found a prehistoric settlement distanced 12 to 13 miles apart—close to small springs and perennial reaches of streams. From Kohistan, the route went up the valley which separated the Kirthar and Laki ranges of mountains, going around the

Manchar lake and then through the Kach Gandava plain into the Bolan plateau which opened upon Quetta.

Close to the Makran coastline, Amri presence is clear in the last quarter of the Balakotian period (ie., Period I) when Nal wares came to be replaced by the Amri fabrics. In the Kohistan region, there are a large number of protohistoric sites which display the presence of Amri ware in the first phase of occupation (Flam 1984:80). In the Kacchi plain in Mehrgarh (IV), certain painted scenes on the Mehrgarh pottery are identical to those at Amri. North and central Baluchi ceramic elements including a number of painted designs, Faiz Mohammad grey ware etc. are also present at Amri. Along with the dissemination of the above-mentioned ceramic traits, this route brought sea shell from the Makran coast to Mehrgarh, where some evidence of shell artefact manufacture has been found. At other points along this axis also shell objects are reported as, for instance, at Amri, Gorandi and Damb Buthi.

This would tend to indicate that by the end of the fourth millennium, a communication axis connected the Quetta plateau, the Kacchi plain and Sind right till the coast. It is also amply clear that the basic orientation of upper Sind was not towards south and central Baluchistan. In fact, Kot Dijian pottery which is found in north Baluchistan has not been found in the same striking way in the Surab valley. In south Baluchistan, Kot Dijian pottery is not present at all.

Sind—Rajasthan—Punjab and Haryana

The Cholistan tract, locally called *rohi*, of Bahawalpur was the connecting link between the Indus plains and Rajasthan. This tract is today a portion of the great Indian desert and is bound on the north and west by a depression known locally as the Hakra; originally, the western fringe seems to have been watered by a river called the Hakra in Pakistan and Ghaggar in India. The distribution of sites along the Ghaggar–Hakra depression makes it quite clear that the route from upper Sind ran from Fort Derawar to Fort Abbas, through the succession of sand dunes which rise in some places to a height of 500 feet to reach the Hanumangarh area where a concentration of pre-Harappan settlements is found.

While the occurrence of Hakra wares at RD 89 in Anupgarh along with the limited Amri features present at Kalibangan suggest the beginning of movement along this axis, the earliest cultural horizon of the Ghaggar–Hakra stretch ie., the Hakra wares period, shared affinities with Amri, Jalilpur and Sarai Khola, and not with regions towards the east. Interaction along this route assumed a much greater significance in the middle of the third millennium BC when elements of the type fossil of the Cholistan tract ie., Kot

Dijian pottery, came to be found in the adjacent regions of Rajasthan and the Punjab. At Kalibangan, for instance, seven Kot Dijian types are found. The proliferation of Kot Dijian sites in the stretch between Fort Derawar and Fort Abbas, an area, incidentally, where the settlements of the Hakra ware period were very few, is evocative of the communication alignment. That raw materials were also procured along this line is evident from the presence of chert/flint artefacts in the Bahawalpur sites and shell beads and bangles at Kalibangan and Banawali. Upper Sind, especially Kot Diji, on the other hand, was exploiting the copper resources of Rajasthan through this axis. The substantial copper/bronze repertoire of Kalibangan was also manufactured, in all probability, from Rajputana copper.

Rajasthan—Punjab and Haryana

The settlement pattern along this axis suggests the orientation of this route. The distribution maps prepared by J.P. Joshi indicate that 43 sites were located in Jind, 29 in Hissar and 11 in Bhatinda (Joshi et al. 1984:515). From this concentration of sites, it is clear that the established channel of communication was from the Hanumangarh area to Bhatinda in the Punjab and Hissar in Haryana. Joshi further mentions that the Sirhind, a tributary of the Ghaggar is one of the most important lines of communication between Rajasthan and Punjab as suggested by the concentration of settlements in adjoining Bhatinda.

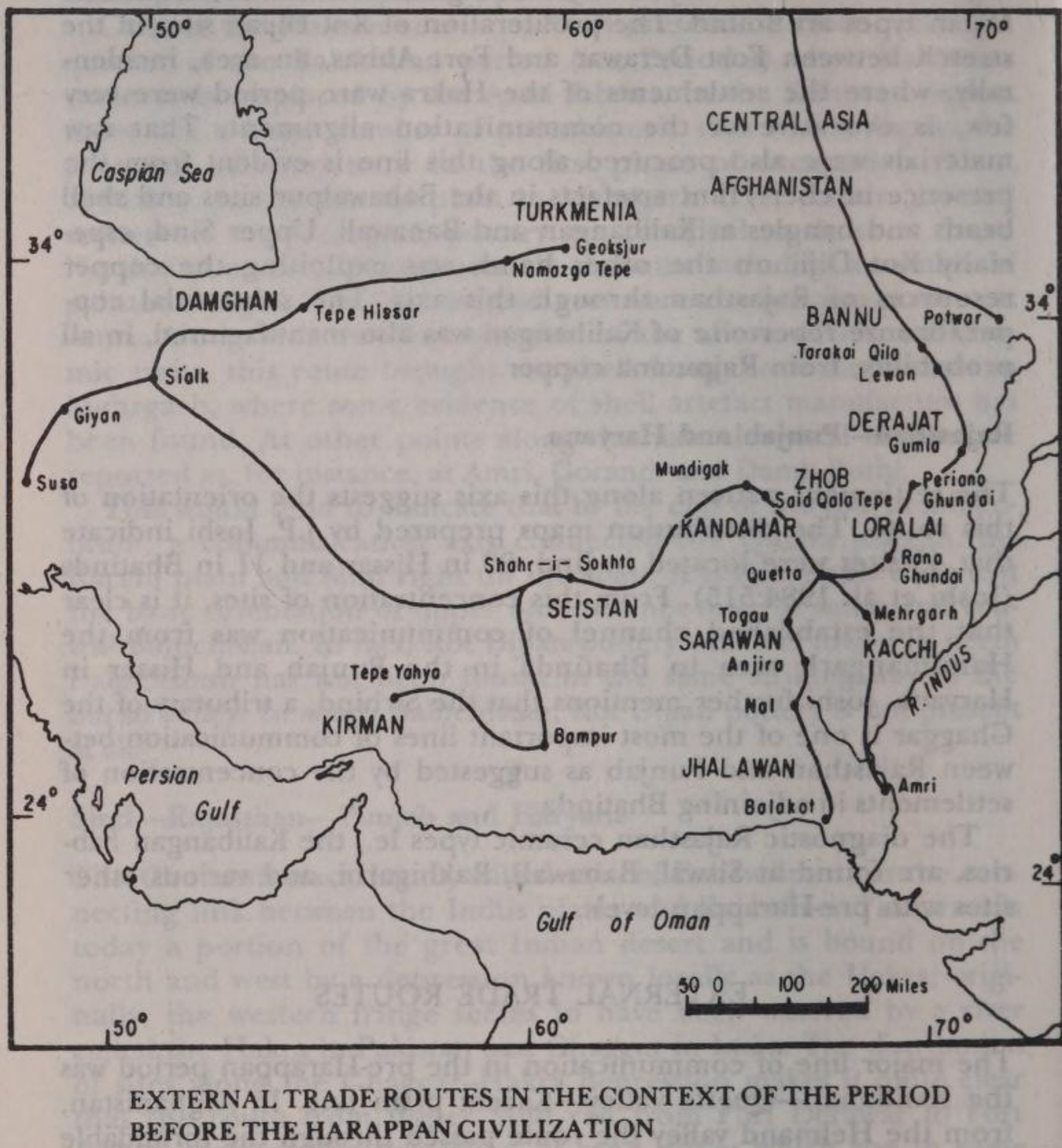
The diagnostic Rajasthan ceramic types ie., the Kalibangan Fabrics, are found at Siswal, Banawali, Rakhigarhi, and various other sites with pre-Harappan levels.

EXTERNAL TRADE ROUTES

The major line of communication in the pre-Harappan period was the Kandahar—Quetta valley—Kacchi plain line. In Afghanistan, from the Helmand valley the route passed through the formidable Khojak pass or the Magzai Bedwan pass, which is an easier defile to cross, into Pishin and then on to Quetta. From Quetta, the Bolan pass connected the Kandahar traffic with the Kacchi tract. Masson's (volume I, 1842:338) analysis of the position of the Bolan in the communication network at a time when the region was still largely untouched by British administration sums up its strategic importance:

> It is interesting on many accounts; being with the Mulloh pass, far to the south, the only route of this level character intersecting the great chain of mountains, defining on the east, the low countries of Kach Gandava and the

Map 5



EXTERNAL TRADE ROUTES IN THE CONTEXT OF THE PERIOD BEFORE THE HARAPPAN CIVILIZATION

> regions of Kalat and Saharawan. There are many other passes over the chain, but all of them from the east have a steep and difficult ascent, and conduct to the brink of the plateau, or table lands. Such are the passes of Takari and Naghow, between the Bolan and Mulloh routes, and there are others to the north of the Bolan. This pass is no less important, as occurring in the direct line of communication between Sind and the neighbouring countries with Kandahar and Khorasan. It also constitutes in this direction the boundary between the Sard Sel and Garm Sel, or the cold and hot countries. The natives here affirm that all below the pass is Hind, and that all above is Khorasan. . . .

In fact, interaction along the Kandahar–Quetta–Bolan line has always been very active. The rulers of Kandahar, apparently, often regarded aggrandizement of this region as a natural corollary to their extended demarcation. In the fifteenth century, Zunnun Beg, the Afghan chief of Kandahar annexed Pishin, Quetta and Mastung to the territories under his control, while his sons Shah Beg and Muhammad Beg descended into the Bolan pass and added Sibi to their father's possessions.

The archaeological evidence indicating communication along this route is in the ceramic repertoire of the sites along this axis—Quetta black on surface. Quetta black on buff, Quetta Wet variants, Mian Ghundai, Kechi Beg white on dark slip, Kile Ghul Mohammad black on red slip etc. have been recovered from Said Qala Tepe and Deh Morasi Ghundai (Shaffer 1978:50–62). Mundigak has also revealed parallels in its ceramics with those of the Quetta valley (Mughal 1971:295, 316). Similar micro drills for bead production have also been found at Mundigak and Mehrgarh (Jarrige 1981:109).

From the Quetta valley, feeder routes led to the Sarawan–Jhalawan region on the one hand and through the Zhob valley on to the Gomal plain on the other. Nal ceramic types have been found at Said Qala Tepe (Shaffer 1978:84–5). Gomal valley figurines have been unearthed at Said Qala Tepe as well (Shaffer 1978:81).

Although no artefacts of north Afghanistan provenance or influence are found in the distribution area of the cultures which preceded the Harappan civilization, that certain raw materials were being imported from there seems to be reasonably certain. The raw material which has been most often discussed, in this context, is lapis lazuli of which artefacts were manufactured in a number of sites in what can be considered the northern portion of the distribution zone of this period—Jalilpur in the central Indus plains, Gumla and Rehman Dheri in Derajat, Lewan Dar Dariz and Tarakai Qila in the Bannu basin and Sarai Khola in the Potwar plateau. Since the Zhob and Loralai valley/sites contain no lapis in their artifactual repertoires, the probability of Chagai lapis being used in the abovementioned sites is unlikely. The route or routes through which lapis lazuli (and possibly some copper and silver as well) was

coming from Afghanistan probably, in the light of the subsequent history of the region, must have gone through the Swat region, traversing Chitral from where the Dorah pass provided access into the Badakshan district of Afghanistan (Nevill 1910, reprint 1977:4).

The pre-Harappan period was also distinguished by an Iranian connection which is exemplified strongly in north and central Baluchistan. The direction of movement must have been from Tepe Hissar through the Mashad region which is the border area of Turkmenistan. This evidence is mostly in the form of common painted motifs often with striking similarities, as in the case of Rana Ghundai II and Hissar IA (Piggott 1961:129; for dating cf.Dyson 1965:232–9). Very limited Nal elements are also found at Shahr–i Sokhta and Tepe Yahya (Amiet and Tosi 1978:22–33; Shaffer 1978:93). It is also possible that the Geoksjur motifs on Quetta valley pottery (Jarrige 1985a: vi; Kohl 1984:101) were mediated through Iran (cf. Biscione 1973:113–14). The motifs in most cases, however, are executed on indigenous pottery types. Furthermore, even when the executed pattern is almost identical, the content differs from region to region—as, for instance, in the case of the fauna depicted at Rana Ghundai and Hissar pottery. The general impression that one has is that we are dealing with a number of patterns and motifs which are common to a large part of the West Asian and subcontinental north-western borderlands.

SUMMARY

The pre-Harappan communications system consisted in the first place of important land routes which closely integrated the hills and plains in what seem to have been mutually beneficial relationships that included trade in raw materials,and involved the sharing and borrowing of a number of cultural traits. North and central Baluchistan right till the edge of the Indus plains where, in the Kacchi tract, Mehrgarh was flourishing, had completely opened out in all directions. (1) The Quetta–Nushki axis brought raw materials like turquoise, lapis lazuli and possibly some copper from the Chagai hills. (2) The Fort Sandeman—Gomal—Sind route integrated the Kot Dijian cultural province with north Baluchistan. (3) The longitudinal valleys of central Baluchistan mediated Nal ceramic traits to the northern regions. (4) There was another route which linked central and south Baluchistan to the Sibi plain and northern Baluchistan through the Kirthar mountains which, if the concentration of the Kulli cultural levels is any pointer, became more significant in the period of the Kulli culture. (5) The routes across the Kirthar also closely integrated the Sind province and the south and central Baluchistan tract. (6) Another clearly identifiable

axis flourished between lower Sind, through the central Indus region, and the Bannu basin on the one hand, and the Potwar plateau on the other. (7) From the Bannu district there was a route to north Afghanistan along which lapis lazuli, silver and copper were procurable. (8) Sarai Khola and other settlements in the Potwar plateau were also linked to the mountainous regions to their north as far as the Swat valley where Kot Dijian ceramic traits have been discovered.

Many of the important sites, in terms of their location, were instrumental in modulating the channels of movement—one such site is Mehrgarh, located on the Kacchi plain, at the foot of the Suleiman mountains where the Bolan pass opens a way through the mountains. It lies directly on the Kandahar–Quetta–Indus Valley line. Similarly Periano Ghundai is located at the junction of the Zhob river with the Gomal, on the time-honoured route connecting Baluchistan and Afghanistan with the Derajat region on the upper Indus plains. In the Bannu basin almost all the sites are concentrated in the Kurram–Tochi doab, a region which has seen a number of invasions as well as through which *Powindah* kafilas used to pass even till the beginning of the twentieth century. Most of these routes were geographically defined, weaving their way through the phalanx of mountains where the streams have somehow managed to gouge out narrow gateways into the plains, locales which, incidentally, were also ideal for settlement.

Other lines of movement connected the heartland of Sind with the plains regions to its east. (1) One route which clearly developed in this period linked the Indus plains and the Indo–Gangetic divide. The distribution of Kot Diji sites in the Bahawalpur tract of Cholistan is one of its sure indications, a development presaged to some extent in the fourth millennium B.C., as the distribution of the Hakra wares in this tract seems to indicate. (2) From the Hanumangarh region, the route went through Bhatinda and Hissar into the heartland of Haryana. (3) South of Hanumangarh, was the core of Rajasthan's copper deposits to which a route from Kalibangan went through the Jhunjhunu region to the Sikar district where the Ganeshwar–Jodhpura complex flourished. (4) Routes also connected the Khetri region to the important pre-Harappan sites such as Banawali, Siswal, Rakhigarhi etc. of Punjab and Haryana.

The distribution of raw materials in the form of finished products at different sites and their basic geographical or natural distribution clearly suggest that these cultures were not dependent on long-distance traffic for major items of their use.

Still long-distance trade was definitely one element in the interaction nexus. The routes which were important in this context were:

(1) the Bolan–Quetta–Kandahar line along which the movement of important cultural items found at Mehrgarh, Quetta region sites, Mundigak and Said Qala Tepe took place. From Kandahar, routes went across to Iran, especially Tepe Hissar, from where Soviet Turkmenia was also accessible; (2) a route from the Derajat region went through the Bannu–Kohat region to Kabul from where north Afghanistan was reached, whose lapis lazuli, çopper and silver seem to have reached some of the sub-regions in this period.

NOTES TO CHARTS

1. *Mehrgarh* : Jarrige and Lechavallier 1979:470, 478, 497, 503, 508, 515; Lechevallier & Quivron 1981:80, 81, 82, 85, 86, 87, 89, 99; Jarrige 1981:99, 108–9, III. *Lahar* : Mughal 1972:141 *Khoedada* : Mughal 1972:142. *Haji Qaim Khan* : Mughal 1972:144. *Jagjai* : Mughal 1972:144. *Bhut Shamsi* : Mughal 1972:146. *Ispeliniji* : *PA* 1964:205. *Rana Ghundai* : Fairservis 1959:301. *Periano Ghundai* : Fairservis 1959:330. *Kili Ghul Mohammad* : Fairservis 1956:230, 234–36. *Q 13* : Fairservis 1956:230. *Q 8* : Fairservis 1956:234. *Damb Sadaat* : Fairservis 1956:231, 237–8. *Kechi Beg* : Fairservis 1956:238.
2. *Nal*: Hargreaves 1929 : 40–4. *Balakot* : Dales 1979:253–5.
3. Aitken 1907:26–9.
4. *Lewan* : Allchin et al. 1986: 41–87. *Tarakai Qila*: F.R. Allchin & Knox 1981 : 249–50; Allchin et al. 1986:194. *Sheri Khan Tarakai*: Khan, Knox and Thomas 1989:286. *Sarai Khola* : Halim 1972:4, 9, 11, 12, 15, 16, 18. *Rehman Dheri* : Durrani 1984:509; Khan 1977:379. *Gumla* : Dani 1970–1 : 1–177. *Jalilpur* : Mughal 1972:119, 124, 157; Shaffer 1979:21. *Jhang* : Mughal 1972:32.
5. *Amri*: Majumdar 1934:32–3; Mughal 1971:141, 173. *Damb Buthi, Ghazi Shah, Gorandi, Kohtras Buthi, Othmanjo Buthi, Khajur, Lohri, Bandhni, Pandi Wahi, Chauro, Tando Rahim Khan* : Majumdar 1934:75–6, 87, 102–8, 113–15, 120, 122, 125, 133–5, 141.
6. *Kot Diji*: Khan 1965:38, 82–5. *Ghaggar–Hakra sites* : Mughal 1971:176. *Charaiwala ther* : Dalal 1980:21, *Kalibangan* : B.B. Lal 1979:70; Agrawala 1984:160. *Banawali* : Bisht and Asthana 1979:225; Bisht 1982:116. *Rohira* : *I.A.R.* 1982–3:66. *Mitathal* : Bhan 1975:6.
7. Raghunandan et al. 1981:63–143; Erskine 1909:351.

3

The Harappan Civilization

The intention of this chapter is not to describe Harappan trade in all its complexity, but to discover a general pattern in the routes through which this trade was articulated. Our attempt will be the determination of the 'contact zone' of sites on the basis of various categories of non-local raw materials found there and the reconstruction of the pattern of trade routes with reference to the source areas of these raw materials. In a civilization where significant uniformity existed in several of its features, this is the only kind of data that can throw light on the various interconnections between different regions. Settlement pattern data are also useful for suggesting the orientation of the possible routes and will be used as far as possible.

DATA ON INTERNAL INTERACTION

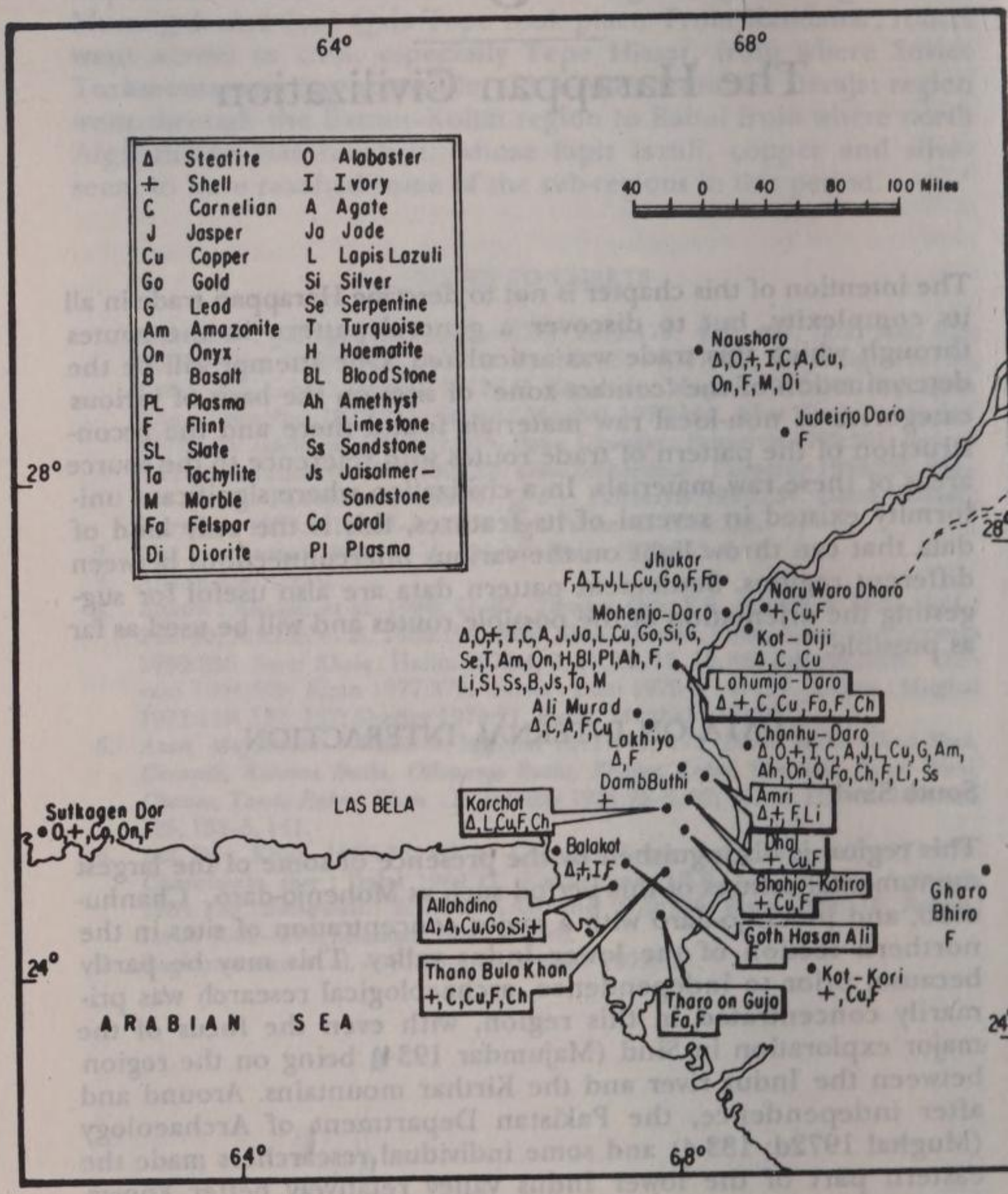
South Sind

This region is distinguished by the presence of some of the largest monumental centres of this period such as Mohenjo-daro, Chanhu-daro, and Judeir-jo-daro with a major concentration of sites in the northern section of the lower Indus valley. This may be partly because, prior to independence, archaeological research was primarily concentrated in this region, with even the focus of the major exploration in Sind (Majumdar 1934) being on the region between the Indus river and the Kirthar mountains. Around and after independence, the Pakistan Department of Archaeology (Mughal 1972d: 133-4) and some individual researchers made the eastern part of the lower Indus valley relatively better known archaeologically (Lambrick 1964; A.R. Khan 1981).

The Sitewise Distribution of Raw Materials

The variety of raw materials used in the production of diverse artefacts by the sites of Sind in the period of the Harappan civilization is clear from a reading of Charts 8a–c. Briefly these raw mate-

Map 6



SITEWISE DISTRIBUTION OF RAW MATERIALS IN SIND AND BALUCHISTAN IN THE CONTEXT OF THE HARAPPAN CIVILIZATION

Chart 8 a

SOUTHERN SIND—HARAPPAN PERIOD

Raw Material	*Mohenjo-Daro*	*Chanhu-Daro*
Steatite	seals, roundels, spacers, terminals, buttons, amulet, finger rings, hairpin, head, pectoral, weights	seals, beads, bangles, finger- rings, earrings, earstud, brooches, ear-pendants, lid, rod, buttons, heart-shaped ornament, cube
Alabaster	maceheads, weights, rings, pedestal, plaque	macehead
Shell	spindle whorls, rings, ladles, handles, small cones, dishes, receptacle, rods, hooks, beads, terminals, amulets, caps, wasters, fragments carved object, piece	balls, gamesman, cones, buttons, bracelets, pendant, fitting, beads, jar stopper, ladles, dish, inlay, bangles,
Ivory	seals, awls, hooks, batons, jar stopper, roundels, wavy ring, unknown object, hair pins, combs, plaque, tusks	dice, pin, comb, peg object
Carnelian	beads	beads, lumps, pendant
Agate	beads, weights	weights, beads
Jasper	beads, weights	beads, weight
Jade	necklaces, miscellaneous beads	
Lapis Lazuli	rough out, beads	terminal, fragment, beads
Copper/ Bronze	tablets, needles, awls, spear head, hook, axe, swords, knives, vessels, mirror, chisels, fish-hook, vases, scale-pan, bangle, bracelet, saw, lance-head, razor, cones, ingots, spatulas, melt, ring, spoon, spacers, reamer, inlay, jar cover, points, sickles, kohl pot, bolt, casting, scale beam, drill, horn, lump, blade axe, rods, earrings, jar handles, figurines, tube,chains, beads, smelting wasters, slag, prills	seals, toy carts, utensils, scale pans, beams, blade axes, adzes, spear heads, lance head, daggers, knives, razors, arrowheads, fish hooks, chisels, awls, rods, spatula, drills, bead tools, shovel, stave heads, ingots, bob, bracelets, rings, fillet, pins, castings
Gold	beads, terminals, necklaces, sheet, bangle	
Silver	seals, casting, vessels, beads, foil, pieces, lumps, cone, bracelet, head ornament, bangle, button	
Lead	weights, net sinker, plumb bob, dish, hook, casting	irregular masses
Semi-Precious Stone	Serpentine beads. Turquoise beads. Amazonite beads. Onyx beads. Haematite beads. Bloodstone beads. Amethyst nodules. Plasma beads	Amazonite beads. Amethyst lump. Onyx beads. Felspar Stone bead. Chalcedony beads
Ordinary Stone	Chert weights, burnishers, flakes. Limestone dish, net sinker, conical stones, mace heads, seals, cones, polishers. weights. Slate dish, palettes. Flint implements. Sandstone animals, mace heads. Basalt querns. Jaisalmer stone handle. Tachylite bead. Marble seal, weights	Sandstone vessels, rubbers. Chert weight, flakes, core, Limestone mace heads, drill heads, rubber. Chert ribbon flakes, saw, cores. Sandstone vessels, rubber. Milky quartz beads

Chart 8 b

SOUTHERN SIND—HARAPPAN PERIOD

Raw Material	*Kot Kori*	*Jhukar*	*Lohumjo-Daro*	*Lakhiyo*	*Ali Murad*	*Damb Buthi*	*Shahjo-Kotiro*	*Karchat*
Steatite		seal, beads	beads	beads	beads			beads
Shell	bangles, wasters		bangle			bangle fragment, beads, handle	bangles, fragment	
Ivory		pin fragment						
Carnelian			bead		beads			
Agate					bead			
Jasper		bead						
Lapis Lazuli		bead						bead
Copper/ Bronze	pieces	arrow-head	spearhead, razor, awl, knife, ring, bead		celt, awl		bangle fragment, chisel, arrow-head, implement	pin fragment
Gold			overlay					
Semi-Precious Stone			Felspar bead	Felspar bead. Chalcedony weight				Chalcedony beads
Ordinary Stone	Chert blades	Flint bead. Chert cores & flakes	Chert cores, flakes	Chert flakes	Chert flakes		Chert flakes	Chert flakes

Chart 8 c

SOUTHERN SIND—HARAPPAN PERIOD

Raw Material	*Dhal*	*Thano Bula Khan*	*Naru Waro Dharo*	*Goth Hassan Ali*	*Tharro on Gujo*	*Amri*	*Allhadino*	*Gharo Bhiro*	*Judeiro-Jo-Daro*
Steatite						bead	seals		
Shell	bangle fragment	bangles	bangles			bangle fragment	beads, bangles		bangles
Carnelian		bead							
Agate							objects		
Copper/ Bronze	ring	bangle	spear head				artefacts		
Gold							artefacts		
Silver							artefacts		
Semi-Precious Stone		Chalcedony weights			Felspar bead				
Ordinary Stone	Chert flakes	Chert flakes	Chert blades & cores	Chert blades	Flint flakes & cores	Chert flakes & cores Limestone balls		Flint blades	Chert blades

rials are steatite, alabaster, shell, silajit, ivory, carnelian, agate, jasper, jade, lapis lazuli, copper/bronze, gold, silver, lead, serpentine, turquoise, amazonite, onyx, haematite, bloodstone, plasma, amethyst, chert, yellow Jaisalmer stone, limestone, slate, sandstone, basalt, tachylite, marble, chalcedony, quartz, and felspar.

The Evidence of Manufacture of Finished Products at Different Sites

Steatite: Mohenjo-daro and Chanhu-daro were important centres of steatite-working. The redocumentation of Mohenjo-daro by the Aachen University Project contains definite indication of debitage left by small steatite-working units in different parts (Pracchia, Tosi and Vidale 1985:234). Kenoyer (cited in Pracchia, Tosi and Vidale 1985:234) also discovered in the site labelled AA 14 at Mohenjo-daro a concentration of steatite wasters which seem to be the residual evidence of the manufacturing sequence of the thin disc-shaped wafer beads. At Chanhu-daro, the significant number of unfinished specimens (about ten specimens can be seen in Mackay 1943:Pl. LI) of seal-amulets and impressions in the Harappan level, clearly demonstrates their manufacture there. Also, an unspecified number of wafer beads in an unfinished condition were found in what has been identified as a bead-maker's workshop there (Mackay 1943:205).

Shell: Evidence of shell-working has been found at a number of sites. At Mohenjo-daro, the old excavations (Marshall 1931, volume I:564), had revealed some workshops for the production of shell inlay together with some deposits which indicated unfinished items or wastes. For instance, in L Area the following evidence was found: 35 shells in Chamber 44, 11 shells in Chamber 53, 15 shells in Court 69, 24 shells in Space 70 and 23 shells in Chamber 27, and other small finds as well. Most of them were complete shells, while some of the shells had their columellae removed. In a recent study of the shell industry at Mohenjo-daro, Kenoyer (1985) highlighted the plethora of activities connected with this industry there. Although there is a range of marine mollusca represented at Mohenjo-daro, Kenoyer has focused on the larger gastropods ie., *Turbinella pyrum, Chicoreus ramosus, Lambis truncata sebae* and *Fascolaria trapezium.* A large quantity of shell bangle fragments (35 per cent), wasters (used in inlay), and the discovery of a heavy concentration of fragments produced by chipping tips of *Turbinella pyrum* (Pracchia, Tosi and Vidale 1985: 240-1) on the surface of a low mound east of the main compound are among the important finds. At Chanhu-daro, fragments of shell bangles, unfinished ladles, and a number of unperforated cowries clearly testify to the site being a centre of manufacture (Mackay 1943:307, 316–17). At

Kot Kori, shell bangle manufacture was undertaken from large marine gastropods which have been found in a sawn condition (Khan 1981:1942).

Ivory: Although it cannot be definitively stated that ivory manufacture was undertaken at Mohenjo-daro, the presence of two tusks there (Mackay 1938:579) indicates that ivory in raw material form reached the site. We may also mention in this regard that a large number of the provinces of Sind like Hyderabad, Nawabshah etc. were traditionally known for their ivory work even till the end of the nineteenth century (cf. Aitken 1907:400).

Semi-Precious Stone: Among the semi-precious stones exploited at the sites of southern Sind were carnelian, agate and jasper. Additionally, Mohenjo-daro and Chanhu-daro were important centres of bead-making. Chanhu-daro's distinction as being a centre of bead-making in the 3rd–2nd millennium BC has been widely highlighted (Mackay 1943; Gupta 1984). The evidence here is of three kinds: (i) tools such as drills which have been found in broken and unbroken form in significant quantities, bead hones and other bead tools; (ii) lumps and nodules of agate, amethyst, transparent white crystal, and carnelian and (iii) a number of unfinished bead specimens and chipped nodules, on the basis of which Mackay reconstructed the stages through which a bead of the long barrel cylinder type had to pass before completion (Mackay 1943: 212, 320, 209, 211, 314). Agate beads were definitely produced locally by the lapidaries at Mohenjo-daro where a number of unfinished beads ranging from light brown, light grey to dark green and white have been found (Mackay 1938:501–2). In fact, the bead-making sequence of a number of the above types has been reconstructed by Pracchia et al. (1985:239) whose surmise as regards the skills of the Mohenjo-daro lapidaries is as follows:

> The impression one gets in examining the whole sequence is one of relative efficiency, being the fruit of an intimate knowledge of the idiosyncratic behaviour of the different varieties on record to minimize the waste. If we think, furthermore, that together with the mentioned chalcedony group we find quite different stones, such as serpentine, which splits according to large disclastic planes, or lapis lazuli, whose single perforated roughout demonstrates the presence of the grooving-and-splitting technique identified at Shahr-i Sokhta, the range of technological constraints, imposed by the materials on to the transformational sequences becomes larger and larger.

Lapis Lazuli: Limited evidence of lapis lazuli bead-making has been found at (i) Mohenjo-daro in the shape of a single perforated roughout (Pracchia, Tosi and Vidale 19885:239) and, (ii) Chanhu-daro where two unfinished beads have been found (Mackay 1943:209).

Ordinary Stone: The stoneworker's craft was undoubtedly widely practised at Mohenjo-daro. Mackay (1938:583–4) has commented on their expertise in this direction and his description of certain objects of limestone in this regard is clearly evocative of their skill. Unfinished pieces of stone statues made of limestone, have been found in the DK and SD areas (Mackay 1938:257). In the area designated AA40 by the Aachen University team, some unfinished items, may document the manufacture of small objects like gaming pieces (Pracchia, Tosi and Vidale 1985:240. See Tosi et al. 1984). This area also yielded broken squared roughouts of banded chert for cuboid weights. Earlier, Mackay (1938:401-2, 395–96) had reported some unfinished chert weights and flint cores, from which the ribbon flakes were undoubtedly struck off, at Mohenjo-daro. The making of chert weights was also an important craft at Chanhu-daro where Mackay (1943:226) noted many unfinished and finished specimens.

Copper/Bronze: Although the range of copper/bronze objects from Mohenjo-daro is impressive, the evidence for metal-working at the site itself is, relatively speaking, remarkably scarce. Copper in its raw form has not been encountered at all and there seems to be no evidence of smelting furnaces and kilns. A number of copper lumps, ingots and castings have, however, been found (Marshall 1931:484; Mackay 1938:450–1). In the Craft Activity areas identified by the Aachen University Research project, the limited evidence of metal working is equally striking (Pracchia, Tosi and Vidale 1985:229–232). Only small surface scatters of indicators have been recovered, one example being the Activity area in number 19 where over an area of 4.5 sq. m., a small cluster of bronze smelting wasters, including some remains of furnace walls, bronze slag, prills and a single perforated cylinder of copper have been recovered. At Chanhu-daro, no copper ore was found. However, most of the copper and bronze artefacts were recovered from Squares 8/B, 8/C and 9/C which, in the opinion of Mackay (1943:175), probably represented the areas inhabited by the metal workers, a surmise which is strengthened by the presence of the unfinished castings as well as an ingot from the same area. The presence of copper/bronze slag at Allahadino, a site which has also yielded a large number of artefacts in the same metal, has been mentioned by Fairservis (1982:109).

Silver: A surface concentration (20–25 sq. m) which included a crucible and some slag, apparently indicative of silver-lead ore smelting was found at Mohenjo-daro (Pracchia, Tosi and Vidale 1985:232).

The Raw Materials Found Within the Sub-Region

The presence of ordinary stone, including flint/chert, semi-precious stone, shell and gypsum has already been noted (pp. 22, 24, 28, 46, Chart 3).

Ivory

Although the elephant is practically extinct in north-west India today, the fact that representations of this animal occur in significant numbers on the seals of the Indus valley, as well as the presence of considerable forest cover in the region in that period indicate the possibility that it was part of the local fauna of the region in the third millennium BC.

The Raw Materials Available Outside the Sub-Region

BALUCHISTAN

The occurrences of copper, lead, agate, jasper, lapis lazuli, turquoise, serpentine and steatite have already been noted (pp. 18–24, 35).

Haematite

In the Chagai district, at Robat Koh and Malik-i-Siah Koh, the presence of haematite, a heavy and relatively hard oxide mineral, has been attested to by E. Vredenburg (Buller 1906:129).

Silajit

Bolan area: Silajit or *mumiai* as it is locally known, is mentioned in the Bolan District Gazetteer as occurring in small quantities in a hill a mile from the Kundalani levy post (Buller 1906:62); the nature of the silajit is, however, not mentioned.

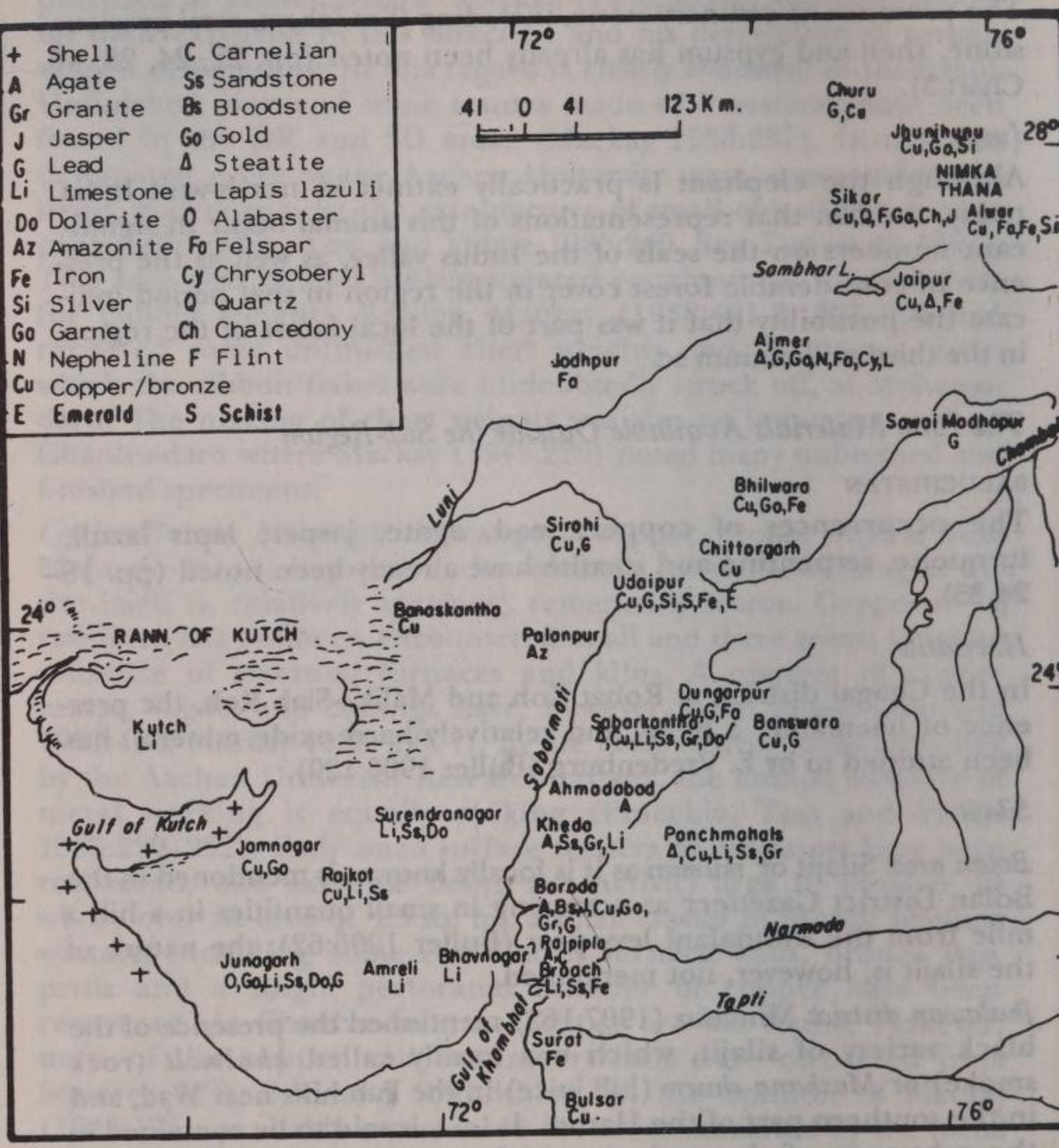
Jhalawan district: Minchin (1907:162) mentioned the presence of the black variety of silajit, which was locally called *khalmolt* (rock smoke) or *Mashana churro* (hill juice) in the Pab hills near Wad, and in the southern part of the Harboi. It '. . . .is said to be contained in the substance of the rocks in which it appears as an exudation drawn out by the heat of the sun. . . . It is collected during the hot weather before the rains set in' (Minchin 1907c:162).

Loralai district: Silajit is found in the Jhalar hills, in Dhol and in the hills in Bori (Minchin 1907a:231).

RAJASTHAN

The presence of copper, agate, jasper and steatite in this region has already been noted (p. 49, Chart 7).

Map 7



RAW MATERIALS AVAILABLE IN RAJASTHAN AND GUJARAT

Lead

There are a large number of lead deposits in Rajasthan, many of which show signs of old workings. The main areas where lead deposits are found are the Ajmer lead-zinc zone, the Jahazpur lead-zinc-copper belt, the Pur-Banera Belt, the Zawar lead-zinc belt, the Dariba-Rajpura Bethumni lead-zinc belt, the Basantgarh-Deri belt, the Rampura-Agucha Zone, the Jasma-Rewara-Karor belt, the Salampura-Kochriya area, the Banswara lead-zinc belt, along with some minor occurrences in Basantgarh (Raghunandan et al. 1981:64–6).

Many of these belts also show evidence of early workings. Among the most extensively studied of these mining sites is that of Zawar, on the banks of the Tiri river (*I.A.R.* 1983–4:77; Willies et al. 1984). Old workings have also been noted at Ghugra (Ajmer district) and Chauth-ka-Barwara (Sawai Madhopur district) (Raghu Nandan et al. 1981:113–14).

Gold

One of the earliest modern references to the presence of auriferous gold in Rajasthan is that of Erskine (1909:265) in the Rajputana Gazetteer of *The Western Rajputana States Residency and the Bikaner Agency*. Erskine mentioned the presence of traces of gold which were noticed by a certain Major Hughes near Rohira in 1897. The most recent work is that of R.S. Jain (1987:99–103) who identified gold mineralization in certain areas of the Jahazpur belt. The specific areas are (Jain 1987:100, 102):

Bhilwara district: Devtalai and Amargarh contain indications of gold mineralization. The core sample of quartz reef from Devatalai assayed 0.2 g Au/tonne while a surface grab sample from the same reef assayed 0.4g Au/tonne. A grab sample of sheared quartz reef from the pit mouth of one of the old workings in Amargarh assayed 1.8 g Au/tonne;

Ajmer district: About three km east of Kharwa, south-east of a small village called Gwara, is a well which is reported to be an old working for gold. It was suggested that this area should be checked up for gold.

Jhunjhunu district: In the Kolihan copper mine, Jhunjhunu district, ore shoots with high copper content were also found to contain a high percentage of gold (Raghu Nandan et al. 1981:74). The percentage of recoverable gold based on the metallurgical tests performed on bulk samples is as follows (Raghu Nandan et al. 1981:75):

Sample Number	*Cu (%)*	*Au (gm/tonne)*
A	7.61	1.53
B	–	3.0
C	2.73	0.4

Also, in the Jhunjhunu district, at Usri (rich in copper deposits) a large number of old workings in the south-western part were supposed to have been worked for gold (Raghu Nandan et al. 1981:97).

Silver

That the galena of the Zawar mines in Udaipur is argentiferous is well known. B.C. Roy (1959:276), for instance, noted the recovery of silver from the lead concentrates by the Metal Corporation of India's smelters at Tundoo. Also, at the Kolihan copper mine (Central block) in the Khetri belt, a percentage of silver was recovered from certain ore shoots by the Geological Survey of India (Raghu Nandan et al 1981:74–5). The percentage of the recoverable silver is given below:

Sample Number	*Cu (%)*	*Au (gm/tonne)*
A	7.61	4.18
B	–	20.66
C	2.73	2.00

There are old workings for lead, silver and zinc at Aguncha which have been dated to 990 BC (information from D.K. Chakrabarti). Lead with 11 per cent silver per ton has also been noted at Jodawas, Alwar (La Touche 1918:304).

Nepheline and Felspar

Nepheline-syenites at Mandaoria, near Kishangarh have been mentioned by H.S. Pareek (1984:71). The presence of felspar in Ajmer, Alwar, Dungarpur and Jodhpur has been reported by Roy (1959:142–4).

Lapis Lazuli

The presence of lapiz lazuli in the Nagpahar hills, three miles to the west of Ajmer had been mentioned by R.H. Irvine (cited in Roy 1959:161; also La Touche 1918:175), although this report was never subsequently confirmed.

CENTRAL ASIA AND CHINA

Jade

The different occurrences in this zone have been outlined by S.C. Nott (1936): (i) the dark green variety was obtained mainly from

Barkul, Manas in Sungaria, the country surrounding lake Baikal and the mountain slopes of western Yunnan; (ii) an emerald green variety could be obtained from Lan t'ien on the borders of the Shensi province; (iii) jadeite occurs *in situ* in the Pamir region, in the valley of the Tunga which is a tributary on the left bank of the Raskem Darra; (iv) the nephrite variety of jade is known to occur in Khotan and Yarkand in eastern Turkestan, the jade mountains in Belurtag on the upper waters of the Tisnab river about eight miles from Yarkand being possibly the most notable source of supply. Nott (1936:1) has also quoted the testimony of a Manchu author (Hsi Yu Wen Chien Liu, published in 1777 A.D.) in this regard: 'There is a river in Yarkand in which are found Jade pebbles. The largest are as big as round fruit dishes, or square peck measures, the smallest are the size of a fist or chestnut and some of the boulders weigh more than five hundred pound. There are many different colours, among which snow white, kingfisher green, beeswax yellow, Cinnabar red, and ink black, are all considered valuable.' It is also well known that jade was exploited in China from the neolithic period onwards. The jade artifacts in what Alfred Salmony (1963:15) calls the Pre-Anyang period ie., from the nebulous Hsia period (2205 BC) till 1200 BC include neolithic axes, from Siberia, and flat ring ornaments, knives, chisels, adzes, rings, beads and segmented and whole slit discs from Kansu, Honan and Shansi.

Gold

Lansdell (1893) noted, among other occurrences, the presence of gold at twenty two places in Khotan.

GUJARAT

Shell

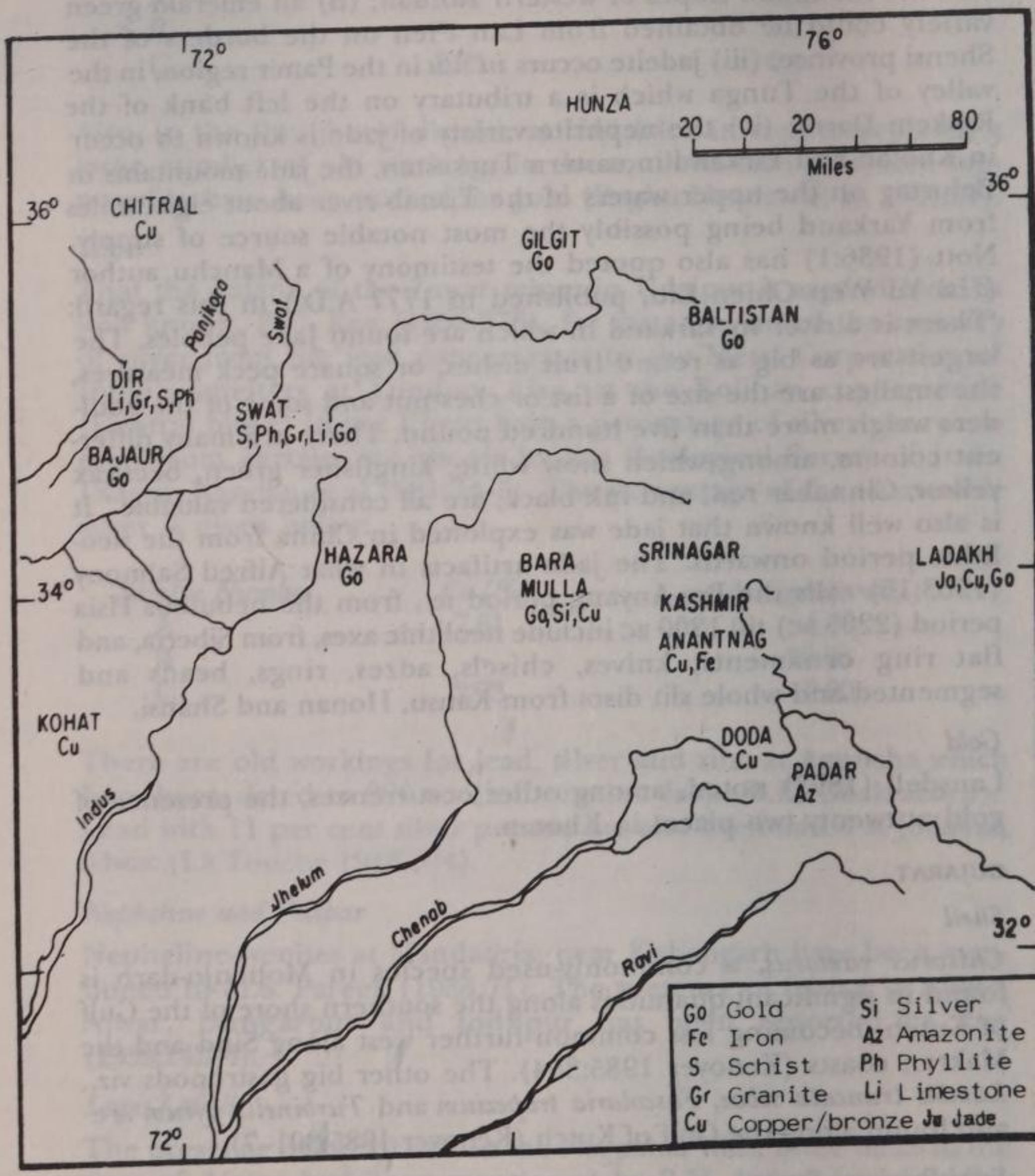
Chicorus ramosus, a commonly-used species in Mohenjo-daro is found in significant quantities along the southern shore of the Gulf of Kutch, becoming less common further west along Sind and the Makran coasts (Kenoyer 1985:304). The other big gastropods viz., *Lambis truncata sebae, Fascolaria trapezium* and *Turbinella pyrum* are also found along the Gulf of Kutch (Kenoyer 1985:301–7).

Semi-Precious Stone

The reference to semi-precious stones, and their exploitation, in Gujarat in the work of Ptolemy and *Periplus of the Erythrean Sea* (cited in *Gazetteer of the Bombay Presidency* 1880:11) suggest an early antiquity. A number of accounts of the pre-industrial tradition of mining and working of these deposits are also available (*Gazetteer of the Bombay Presidency VI* 1880:190–9; B. Allchin 1977).

The most important centres of working and production of semi-precious stone artefacts in Gujarat were Ratanpur and Damlai (*The*

Map 8



RAW MATERIALS AVAILABLE IN THE REGIONS TO THE NORTH OF THE INDUS AND KASHMIR

Wealth of India 1948:37). A large quantity of veined agate occurs in the pebble bed near Ranpur in Ahmedabad district, and in the bed of the Majam river between Mandva and Amilyara. In Kaira district, a particularly beautiful variety of agate occurs at Kapadvanj. In Kathiawar, a large irregular vein of moss agate traverses the Deccan trap at Khijaria and also about half a mile to the south-west of Khakhra. Common agate of greenish white colour is also known to occur in the same neighbourhood. There are a number of localities in the old states of Navanagar and Kathiawar which are reported to be particularly rich in onyx (*The Wealth of India* 1946:37) such as Vijarkhi, Baolidar, Bori and Narmana. Some occurrences in Baroda state where agate (usually banded and associated with bloodstone and jasper) occurs as pebbles in the surface soil (near Narolir, Nahani and Ghalha) have also been noted in the same volume.

JAMMU AND KASHMIR

Jadeite

In the course of a detailed geological reconnaisance in the Khardung-Changal area and along the Shyok valley in the Leh district, Baldev Singh and A.K. Gupta (1987:65–66) located jadeite pods:

> Lenses of serpentines occur in sheared and tectonised zones within rocks of the Khardung volcanics near Digar and Tsoltak. Serpentines comprise mostly antigorite and chrysotile with numerous opaque granules. Jadeite pods have been noticed in these serpentines. Jadeite occurs in the form of pods measuring 3–4m in length and about a metre in width. Jadeite, greenish in colour, fibrous aggregates to columnar in form, has a soapy feel. It shows two distinct cleavages with high relief, modern birefringence, 35–38 extinction angle, and exhibits biaxial positive interference figure.

Gold

Gold occurrences have been noted in two districts (Varadan 1976a: 47–8):

Baramulla district: The presence of gold (and silver) in traces is to be seen in the Lashteal hill spur;

Ladakh district: R.D. Lyddekar in the nineteenth century recorded several pits for panning alluvial gold in the Kio or Sklo area, where concentrations occasionally reached 6.65 grams of gold per cubic yard of gravel (cited in Varadan 1976a:48).

Amazonite

Pascoe (1931:678) mentioned the possible presence of amazonite, a green felspar mineral, in the Padar region of Kashmir.

AFGHANISTAN

Silver and lapis occurrences have already been noted (p 28).

Gold

Gold is known to exist three miles to the north of Kandahar (Pascoe 1931:674), where mining had been abandoned shortly before 1881—the contact zone where gold was found was traced to the south-west for a distance of about seven miles (La Touche 1918:190). Pascoe also noted that in the region to the north side of the Hindu Kush small quantities occurred as well as in the streams draining the Kuh-i-Baba, Kohistan, above Laghman and Kunar.

EASTERN PUNJAB

Amazonite

Amazonstone/microline is abundant in the granite of Tosham, eighty miles west-north-west of Delhi (Mallet 1887:107).

Discussion

The inter-regional communication between Sind and Baluchistan had clearly been foreshadowed in the centuries prior to the efflorescence of the 'First Urbanization'. With the onset of the mature phase of the Harappan civilization, undoubtedly, a more rigorous kind of centralized authority along with all its attendant structures came to dominate Sind. The artefactual remains at Mohenjo-daro, Chanhu-daro, Allhadino etc. all testify to the requirements of the region for resources which could not be obtained locally by the former, but which were available in Baluchistan; these ranged from essential metals like copper to 'luxury' minerals such as turquoise and lapis lazuli. This demand, under the aegis of a more powerful structure than before, came to be articulated also in a more organized way. In fact, sites—like Pathani-damb, a large Harappan settlement at the entrance of a major pass on the Kirthar piedmont—which have been interpreted as being possibly connected 'with the military aspect of the Indus civilization' (de Cardi 1964:29), in our opinion, are among the striking indicators of the organized interaction and trade that existed between Baluchistan and Sind.

However, Baluchistan was not the only region with which Sind was interacting and it is mostly likely that Rajasthan, Central Asia and Gujarat were also involved in various kinds of trade relationships with it. Considering that the analysis of copper/bronze artefacts of Mohenjo-daro clearly shows that heterogeneous sources of copper ore were being utiiized, and also keeping in mind the existence of rich copper deposits in Rajasthan whose cultural complex contemporaneous with the Harappan civilization ie., the Ganeshwar complex, shows evidence of contacts with the latter, it is most likely that copper ore was being imported from Rajputana.

Theoretically, Rajasthan could have supplied semi-precious stones to Sind, although Harappan Gujarat contained rich reserves of chalcedony, carnelian and its allied varieties as well. Some reserves of the chalcedonic varieties of semi-precious stones were available in Sind itself and are found even in the artefactual repertoires of some of the pre-Harappan horizons in that region.

Central Indus Plains

Although the central Indus plains have, right from the beginning, been within the mainstream of Harappan studies by virtue of one of the biggest city-settlements of the civilization being located here, in relation to the neighbouring regions of Sind and Bahawalpur, this alluvial expanse appears to have been very sparsely inhabited. The only other significant settlement of this region was Chak Purbane Syal. The *Excavations at Harappa* (Vats 1940; also see Wheeler 1947) remains the major work on the region, containing, apart from all the details of the excavations at Harappa, a brief report of the artefacts discovered from the mound of Chak Purbane Syal.

The Sitewise Distribution of Raw Materials

Chart 9 amply exemplifies the variety of raw materials - minerals, metals, animal products - that were being used in the central Indus Plains. These raw materials were steatite, alabaster, shell, ivory, coral, carnelian, agate, jasper, chalcedony, jade, lapis lazuli, copper, gold silver, lead, chert, sandstone, limestone, yellow Jaisalmer stone, flint, haematite, quartzite, basalt, *sang-i-abri*, marble, calacite, serpentine, felspar, hornblende, slate and granite.

The Evidence of Manufacture of Finished Products at Different Sites

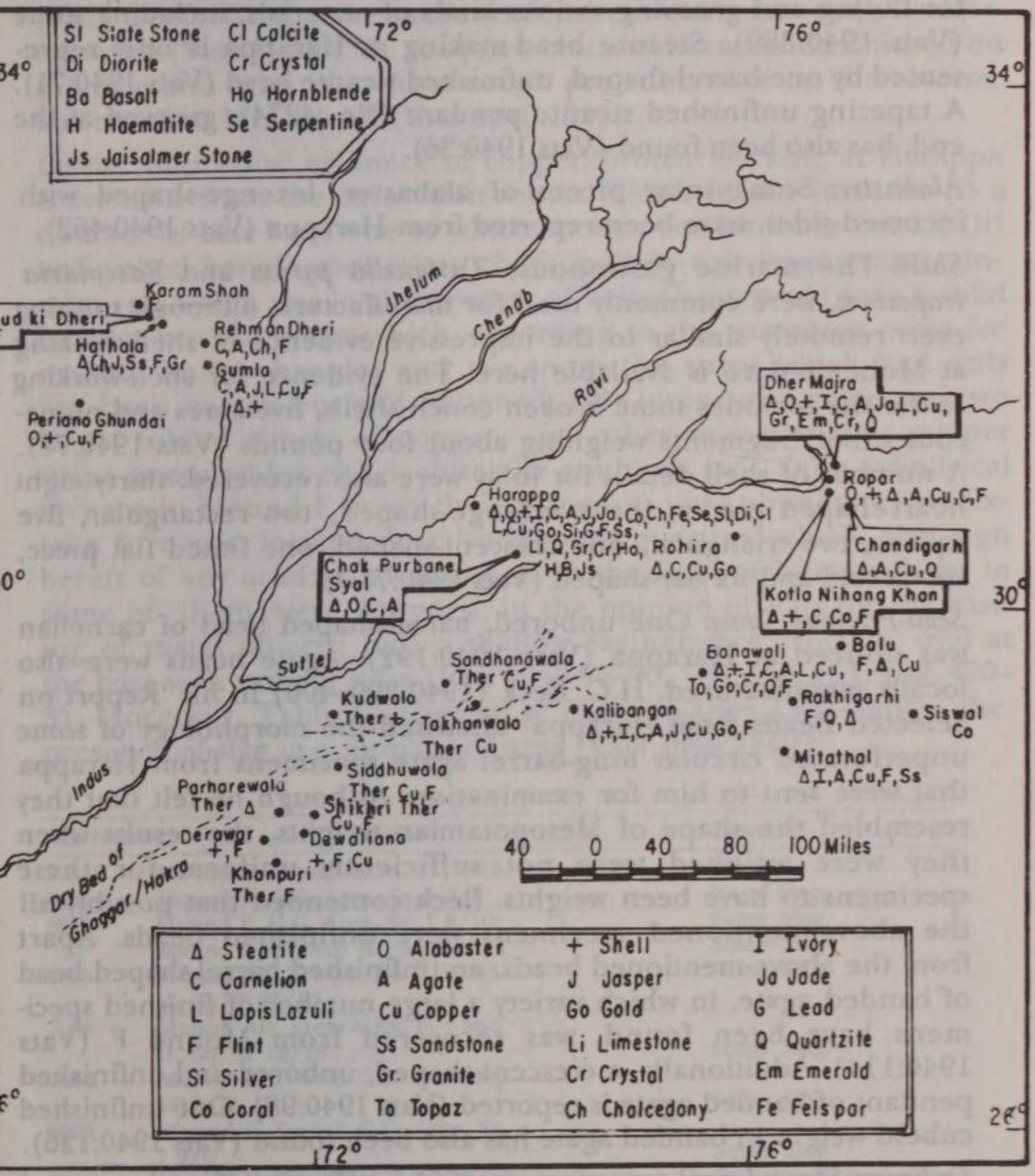
Steatite: The manufacture of seals seems to have been an important craft activity at Harappa. Twenty-three unfinished seals have been found from Mound F and Mound AB:No. 5551, No. 1204, No. 10260, No. 1239, No. 5219, No. 2785, No. 2731, No. 2394, No. 12104, No. 11012, No. 11040, No. 10998, No. 12140, No. 11432, No. 11440, No. 4432, No. 71113, No. 11768, one unfinished black seal, and four unfinished rectangular seals of the plano-convex type which are not numbered (Vats 1940: 25, 38, 54, 71, 82, 113, 121, 122, 125, 128, 134, 151, 156, 173, 179). Burnt steatite inlay was also practised at the site; some such fluted specimens were found sticking to miscellaneous broken copper objects in a well in Trench IV, Mound F (Vats 1940:462). Interestingly a number of gouges, made

Chart 9

CENTRAL INDUS PLAINS—HARAPPAN PERIOD

Raw Material	*Harappa*	*Chak Purbane Syal*
Steatite	Vases, seals, inlays, pendants, figurines, spacers, temple ornaments, finger rings, nose discs, amulet, ear ornament, plummet	beads
Alabaster	dishes, vases, lids, pestle, palettes, maceheads, lingam, cone, ring bases, pedestals, handle, finger rings, inlay, fluted specimens, palettes	pieces
Shell	lingam. animal figurine, pieces, caps, ladles, spindle whorls, beads, temple ornsments, bangles, bracelets, amulets, balls, inlay	
Coral	piece	
Ivory	animal figurine, lingam, bead, temple ornaments, awls, needles, hair pins, rod, comb, balusters, discs, strip, terminal, cones	
Carnelian	weights, baetyl, beads, ball, marbles spheroid, necklaces	bead
Agate	weights, beads, pendant	bead
Jasper	bead, pendants, chessman shaped object	
Jade	beads, pendants	
Lapis Lazuli	Lingam, pendant, beads	
Copper/ Bronze	macehead, vessels, hasp, adze, blade axe, latches, axes, chisels, cast bars, daggers, spearheads, knives, sickles, saws, scrapers, razors, gouges, lance head, naii parer, toilet set, awl, chopper, needles, pins, rods, bangle, scale, mirror, fish hook, pieces, stilus, terminal, sheets, lumps, tube, beads, ear ornaments, bracelets, finger rings, slag, sheets	
Silver	vase, beads, temple ornaments, brooch, bangle, shell-inlaid boss, boss, bezel on copper ring, sheet	
Gold	beads, armlet, forehead ornament, hooks, foil	
Lead	ring, boss, wire	
Semi-Precious Stone	Chalcedony lingams, ball, pebble, beads. Felspar beads. Serpentine beads. Crystal bead	
Ordinary Stone	Chert weights, scrapers, cores, flakes, arrowhead, burnishers, knives. Sandstone block, statuette, dice, querns, pestles, lingams. Limestone maceheads, weight, dish. Yellow Jaisalmer stone lingams, cap, cones, palette, inlay. Hornblende pendants, weight, core frustums, ball, lingam. Quartzite cones. Haematite bead. Slatesto weight, ring. *Sang-i-abri* bead, slab. Flint axe, core. Basalt pestles, querns, palette, celt, Marble macehead, beads. Calcite bead. Diorite bead	

Map 9



SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE REGIONS TO THE NORTH OF THE INDUS, SIND, CHOLISTAN AND EAST PUNJAB IN THE CONTEXT OF THE HARAPPAN CIVILIZATION

of bronze were recovered in the excavations which, in the opinion of the excavator, with their semi-circular cutting edges were used for fluting and grooving various kinds of materials, including stone (Vats 1940:389). Steatite bead-making at Harappa is only represented by one barrel-shaped, unfinished steatite bead (Vats 1940:71). A tapering unfinished steatite pendant (No. 4274), grooved at the end, has also been found (Vats 1940:36).

Alabaster: Some inlay pieces of alabaster, lozenge-shaped with incurved sides, have been reported from Harappa (Vats 1940:462).

Shell: The marine gastropods, *Turbinella pyrum* and *Fascolaria trapezium*, were commonly used for manufacture, although nothing even remotely similar to the impressive evidence of shell-working at Mohenjo-daro is available here. The evidence for shell-working at the site includes some broken conch shells, five cores and numerous other fragments weighing about four pounds (Vats 1940:71). A number of shell details for inlay were also recovered: thirty eight heart-shaped pieces, three lozenge-shaped, two rectangular, five square, two triangular, one crescent-shaped, one fluted flat piece, six discoid and six bar-shaped (Vats 1940:71-3).

Semi-Precious Stone: One unbored, barrel-shaped bead of carnelian was noticed at Harappa (Vats 1940:192). Agate beads were also locally manufactured. H.C. Beck (1940:399–400) in his 'Report on Selected Beads from Harappa' discussed the morphology of some unperforated circular long-barrel agate specimens from Harappa that were sent to him for examination. Although he felt that they resembled the shape of Mesopotamian weights, the results when they were weighed were not sufficiently uniform for these specimens to have been weights. Beck contended that possibly all the above-mentioned specimens were unfinished beads. Apart from the above-mentioned beads, an unfinished barrel-shaped bead of banded agate, in which variety a large number of finished specimens have been found, was recovered from Mound F (Vats 1940:114). Additionally, a crescent-shaped, unbored and unfinished pendant of banded agate is reported (Vats 1940:98). One unfinished cuboid weight in banded agate has also been found (Vats 1940:126).

Ordinary Stone: Local manufacture of chert/flint artefacts is attested to by (i) the large number of cores (Vats 1940: 39, 60, 104, 112); (ii) two unfinished cubical weights (Vats 1940:36, 159); (iii) large unfinished celts (Vats 1940: 69); (iv) a flake (Vats 1940:192), and (v) an unfinished tapering axe (Vats 1940: 107, 172?). Blocks of sandstone (Vats 1940:57), sometimes with tubular drill holes as in the case of a rectangular, dressed out unpolished blocks of yellow sandstone, and the fragment of grey stone are other evidence of stone-working (Vats 1940:141). Weights in sandstone and slate also

seem to have been manufactured here—two unfinished grey sandstone weights and one unfinished slate weight are reported (Vats 1940:361–2). A small, unfinished quartzite cone is also reported (Vats 1940:138). A square block of hornblende finished on the face and sides but with a rough protruberance on the reverse, was noted at Mound AB (Vats 1940:159).

Copper: Impressive evidence of copper/bronze working at Harappa is available from the excavation report. This evidence includes (i) a number of cast bars, one of which shows a few hammer marks; (ii) unfinished bangle specimens which include one fragmentary, uneven rod which was in the process of being beaten out into a solid bangle, two flat strips which, according to the excavator, were for making hollow bangles and two more flat strips which had only just been beaten out and flattened; (iii) lumps of copper and two large, folded sheets of copper; (iv) other miscellaneous copper strips intended for either chisels or cobbler's awls; (v) a cylindrical furnace in Mound F in which slag deposits were abundant; (vi) sixteen furnaces, located near 'workmen's quarters' which, although bereft of any artefactual evidence, in the light of intense firing in some of them, were designed, in the opinion of Vats for the casting of metal objects; (vii) a shallow earthenware crucible, oval at the base with straight sides (Vats 1940:80–90, 126, 150, 151, 182, 470–3). Moreover, Table I—*Contents of Post-Cremation Urns*—notes the presence of slag in a number of urns (Vats 1940:254ff):

Urn Number	*Location*	*Remains*
1033B.	Mound F, Trench I, Sq. 1711/18	Slag
3824	Mound F, G.G. Area, Sq. I 9/3	Bit of Slag
3847	Mound F, G.G. Area, Sq. I 8/10	Some Slag
	Mound F, Trench III, Sq. N 914	Some Slag
5910	Mound AB, Trench Ex. P. I and II, Sq. P 23/10	Some Slag
7174	Mound AB, Trench Ex. P. I and II, Sq. M 12/18	Some Slag
7854	Mound F, Trench G.G. Area, Sq. M12/18	Some Slag
3905	Mound F, Trench G.G. Area, Sq. J 9/9	Some Slag
7867	Mound F, Trench II, Sq. N 9/10	Several pieces of Slag
	Mound F, Trench III, Sq. I 12/3	Copper scum, slag
XXXV	Mound AB, Trench S E., Sq. Q	27/20 Slag pieces
7863	Mound F, Trench G.G. Area, Sq. K 9/3	Lot of Slag
10252	Mound F, Trench IV, Sq. I 12/4	Some Slag
7840	Mound F, Trench G.G. Area, Sq. I 9/1	Piece of Slag

The report also noted the presence of several 'long pieces of slag' in an earthenware jar in Square JG/23 (Vats 1940:27).

The Raw Materials Found Within the Sub-Region

Unlike Sind, where the Kirthar piedmont and its outliers provided some of the basic stones that were used by the Harappan sites of the region, Harappa was located in a minerally poor area.

The Raw Materials Available Outside the Sub-Region

UPPER INDUS PLAINS AND THE NORTH WEST FRONTIER PROVINCE

The presence of steatite, gold, copper and ordinary stone have already been noted (pp. 34, 35, 37, 42–43).

Lead

In the Jhelum district, (*Gazetteer of the Jhelam District* 1883–4:30) in two or three localities of the Salt range, sulphur of lead or galena is found in small nodules. The best quality is said to occur in a place called Mount Karangli. Lead occurrences in the district were chiefly in clefts in the most inaccessible precipices of hills, and 'peasants' in the nineteenth century used to search for it by letting themselves down the face of the precipice and picking out the mineral from the clefts (*Gazetteer of the Jhelam District* 1883–4:30).

Ordinary Stone

The limestone and sandstone occurrences in the Salt range have already been noted. In addition, stone of various kinds is found in the following areas:

Jhang district: In the Kirana hills, quartzites and slates are found in its steep ridges (*Gazetteer of the Jhang District* 1883:3). In the nineteenth century, there were also several quarries in the hills near Chiniot, where millstones, pestles and mortars and *mochi* blocks etc. were made.

Mianwali district: The Dhak range contained soft grey and greenish sandstone and nummulitic limestone (*Gazetteer of the Mianwali District* 1915:8)

Alabaster

Gypsum occurs in the marl beds of the Salt range (*Gazetteer of the Jhelum District* 1883–4: 29–30): 'Beds of it seem to lie above and below the salt, The mineral is for the most part of light grey colour, with a shade of blue, and translucent on the edges.' From places like Pind Dadun Khan, Mari and Kalabagh, significant amounts of gypsum could be obtained.

Haematite

In the Salt range (*Gazetteer of the Jhelam District* 1883–4:30), some earthy iron haematites were found, although not in commercially visible quantities.

JAMMU AND KASHMIR

The presence of jade and gold in the Jammu and Kashmir region has already been discussed (p. 81).

RAJASTHAN

The presence of various metals such as copper, gold, silver, and lead and other raw materials like steatite, agate, jasper etc. has already been mentioned (pp. 49, 77–78).

SIND

Chert/flint, sandstone, among other stones and shell and coral occurrences have already been noted (pp. 22, 28, 34, Chart 3).

AFGHANISTAN

The presence of lapis lazuli, silver and gold has already been mentioned (pp. 28, 82).

CENTRAL ASIA AND CHINA

The presence of jade and gold has been noted (pp. 78–79).

BALUCHISTAN

The presence of steatite, serpentine, copper, and lapis lazuli has already been mentioned (pp. 18–24, 35).

Discussion

The centrality of the urban centre of Harappa to the resources available in the upper Indus plains, the North West Frontier highlands and lowlands, Rajasthan and Sind has been highlighted (also see Fentress 1976). The point here is that although Harappa was located in a broad alluvial expanse, the range of raw materials that it exploited, with the exception of jade, was largely accessible in either (i) conjoining regions, the Derajat being one such example, (ii) regions within the Harappan distribution area, such as Sind and Baluchistan, or (iii) regions which, while being geographically outside the larger hinterland of the Bari doab, displayed clear cultural correlations with the Indus civilization; Afghanistan and Rajasthan are two such areas.

One anomaly which has often been pointed out in this regard is the absence of settlements with a mature, urban Harappan phase in the above-mentioned region. In this regard, Possehl (1984:86) had considered the possibility of the early Harappan material assem-

blage, which is found at a number of sites, persisting in western Punjab and therefore being contemporary with the urban phase of the Indus tradition. The implications of a series of late radiocarbon dates from a number of sites in this region are, in this context, suggestive since they imply the survival of the Kot-Dijian level in the latter part of the third millennium BC. These radiocarbon dates which form a homogeneous group are from six different sites ie., Tarakai Qila and Islam Chawki in the Bannu basin, Rehman Dheri in the Gomal Plain and Sarai Khola, Jhang and Hathial West in the Potwar plateau (cf. Possehl 1988). In such a situation, the role of these sites in articulating trade with Harappa, was significant. The evidence of precious and semi-precious stone working in Lewan Dar Dariz and Rehman Dheri suggests that these resources were being procured from the Bannu and Derajat regions. The presence of lapis lazuli in some sites in the regions north of the Indus suggests that Afghan lapis was being mediated through them to Harappa.

However, one essential metal not available in any significant quantity in the Punjab plains was copper. In the light of the diverse copper/bronze artefacts found at Harappa, and the presence of extensive old workings and the striking protohistoric copper/bronze Ganeshwar/Jodhpura complex there, in all probability, copper was coming directly or indirectly to the site from Rajasthan.

The other region on which Harappa depended for an essential raw material was Sind where, in the Rohri hills, an area of approximately 40 by 16 kms is covered with factory sites for the extraction and dressing of chert artefacts. In a survey of this region, B. Allchin (1979:74–211) noticed Harappan working floors with a concentration of blades, blade cores and all the by-products of blade core preparation. The average width of the thirteen broken blades at Harappa ie., 1.43 cms is very close to those found on the Rohri hills ie., at Sukkur, the average centimetre width was 1.40 (B. Allchin 1979:174–211).

Upper Indus Plains—Derajat Region

In comparison to the preceding phase, the Gomal plain, which lies along one of the major arteries connecting Baluchistan and Afghanistan with the Indus plains, does not seem to be as 'densely' settled in the mature Harappan period. Although Rehman Dheri III and Gumla IV represent the Harappan periods there (see Shaffer 1979), exhaustive details about their respective artefactual inventories are not available.

The Sitewise Distribution of Raw Materials

The raw materials used at the sites of this region are clear from a reading of Chart 10. These raw materials are steatite, shell, carnelian, agate, jasper, lapis lazuli, copper, turquoise, flint, chert, chalcedony, granite and sandstone.

Chart 10

DERAJAT REGION—HARAPPAN PERIOD

Raw Material	*Gumla*	*Rehman Dheri*	*Karam Shah*	*Bud Ki Dheri*	*Hathala*
Steatite	beads				beads
Shell	bangles				
Carnellian	beads	beads			
Agate	beads	microliths			
Jasper	beads, microliths				microliths
Lapis Lazulli	beads				
Copper/Bronze	rods				
Ordinary Stone & Chalcedony	Flint microliths. Chert microliths, flakes	Flint microliths. Chalcedony piece	Chert flakes, piece	Chert flakes	Sandstone quern, Flint core. Chert microliths. Granite pestle. Chalcedony blade

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: A large variety of blade cores which were classified into three categories ie., chisel-ended, conical and flat-based, have been found at Rehman Dheri (Khan 1979:397). Also, at Karam Shah (Dani 1970–1:23), in addition to a large number of chert flakes, a long piece of solid chert, 10 inches in length and 1 inch square in section, was found. Hathala yielded two fluted cores in black chert and flint respectively (Dani 1970–1:101).

The Raw Materials Found Within the Sub-Region

The presence of various kinds of stones in this region has already been noted (p. 37).

The Raw Materials Available Outside the Sub-Region

BALUCHISTAN

The presence of turquoise and lapis lazuli has been noted (pp. 20–23).

Chart 11

UPPER SIND AND THE GHAGGAR HAKRA SYSTEM—HARAPPAN PERIOD

Raw Material	*Kot Diji*	*Kalibangan*	*Khanpuri Ther*	*Dewatiana*	*Shikhri Ther*	*Siddhanwala Ther*	*Parharewala Ther*	*Takkhanwala Ther*	*Derawar*	*Kudwala Ther*	*Sandhanawala Ther*
Steatite/ Soapstone	seals	beads, seals					tablet				
Shell		ring, bangles		bangles, beads					bangles	bangles	
Ivory		combs									
Carnelian	bead	beads									
Agate		beads									
Jasper		beads									
Copper/ Bronze	bangles, rings, blade axe, chisels, arrowheads	rods, pins, bangles, beads, mirrors, arrowheads, hooks, rings, chisels, spear heads, celts, awls, knives, daggers, drills, needles, razors, figurines		needles	needles	ingot		spear heads			sheet
Gold		beads									
Ordinary Stone		Chert blades cores, gamesman	Flint knife	Flint blades, borers	Flint cores	Flint knife	Flint blades,			Flint blades, core	objects

AFGHANISTAN

The presence of lapis lazuli has been noted (p. 28).

Discussion

Some luxury semi-precious stones like turquoise and lapis lazuli were undoubtedly reaching the Gomal plain from external sources. The possibility of Afghani lapis reaching the site is very likely, keeping in mind both the location of the region and the presence of a Harappan settlement in Shortugai in Afghanistan, in a region close to Badakshan.

Upper Sind and the Ghaggar–Hakra system

The Cholistan region of Pakistan and the adjacent region of Rajasthan in India, which lie basically along the dry beds of the Ghaggar/Hakra river have seen some of the most important protohistoric research in the recent past. Mughal's work there has led to substantial modifications in the perspective on Harappan settlement patterns (Mughal 1981:133–42; 1982:82–95). On the Indian side, one of the largest Harappan settlements of the country, ie., Kalibangan, is located here along with a number of other sites (Stein 1942:173–82; Dalal 1980:34). However, details as regards the sites in the Ghaggar/Hakra region, with the exception of Kalibangan, are extremely scanty.

The Sitewise Distribution of Raw Materials

The range of raw materials used in upper Sind and the Gaggar-Hakra region is clear from a reading of Chart 11. These are steatite/soapstone, shell, ivory, carnelian, agate, jasper, copper/bronze, gold, chert and flint.

The Evidence of Manufacture of Finished Products at Different Sites

Copper/Bronze: Mughal (1982:92) mentioned the presence, at a number of Harappan sites in this region, of exclusively craft activity areas which were in his opinion definitely used for the melting, if not the smelting, of copper. It is interesting to notice that there is a profusion of industrial sites (47.7 per cent of the total) in the mature Harappan phase with a clear separation from the habitation areas (Mughal 1982:92). Also, Siddhanawala Ther contained numerous kilns, although the use to which they were put has not been stated (Mughal 1982:92).

Flint: Flint cores have been reported from Dewaliana and Derawar (Dalal 1980:12).

The Raw Materials Found Within the Sub-Region

Copper

The presence of flint and copper in this region, especially in the Bikaner area, has already been mentioned (p. 48).

Ivory

The elephant was probably found around the region since, in the excavated strata of Kalibangan 2, faunal remains of the Indian elephant have been found (*I.A.R.* 1964–5: 38).

The Raw Materials Available Outside the Sub-Region

RAJASTHAN

The significant occurrences of copper, gold, steatite, jasper, and agate here have already been discussed (pp. 49, 77–78, Chart 7).

SIND

Chert and shell occurrences have been noted (pp. 22, 28, Chart 3).

Discussion

The various non-local raw materials that were used in this region were, in our opinion, procurable from Rajasthan. In fact, this region played a very significant role in providing copper, both in an unfinished and finished form to the other regions of the Harappan distribution area. Other artefacts of non-local raw materials such as those of chert and carnelian probably reached this region in a finished form either from Rajasthan or from Sind.

Punjab and Haryana

With the exception of the short note on Kotla Nihang Khan in Vat's report on Harappa (1940:467–7) and Olaf Prufer's work at Dher Majra in the old Nalagarh state (1952), this region has only recently seen some amount of detailed exploration and excavation. Suraj Bhan (1971–2, 1973, 1975), one of the most consistent workers in this area, has primarily worked on the sites of Siswal and Mitathal and the work of the Archaeological Survey of India, especially at Banawali (Bisht & Asthana 1979; Bisht 1982; *I.A.R.* 1983–4:24–8), has made the distribution of the Harappan culture and the regional variations therein more clear. On the theoretical side, Shaffer (1981, 1986) has attempted to evolve an alternative sequential framework

for understanding the relationship between the pre-Harappan and the Harappan cultures, on the one hand, and the Harappan phenomenon and other cultural pockets on the other hand.

The Sitewise Distribution of Raw Materials

The range of raw materials used in the Punjab and Haryana region is clear from a reading of Chart 12. These raw materials are steatite, alabaster, shell, ivory, carnelian, agate, jade, lapis lazuli, copper/bronze, gold, topaz, crystal, emerald, quartz, chert, sandstone, quartizite and granite.

The Evidence of Manufacture of Finished Products at Different Sites

Semi-Precious Stone: Dher Majra, where 1200 beads were recovered on the surface and in the excavations conducted by Prufer (1952:10), was an important centre of bead manufacture. The inventory of beads makes it clear that the majority of manufactured beads were of agate, ranging from 'wine red, opaque, and beautifully banded black and white agates' (Prufer 1952:10). A number of unfinished beads, some partially perforated, others only sparingly shaped, were noted. From Mitathal also, an unfinished agate bead and an agate core provide evidence of agate bead manufacture there, although both were recovered from unstratified levels (Bhan 1975:62, 70).

Ordinary Stone: The vast diversity of beads and the unfinished specimens which testify to the various stages of bead manufacture there provide unambiguous evidence of local production at Dher Majra (Prufer 1952:10). The evidence of local stone-working at Banawali and Ropar is in the form of fluted cores (Bisht 1982:120; Sharma 1982:154).

Copper/Bronze: The only evidence of copper/bronze activity is from Siswal where a crucible with some copper oxide attached to it was reported (Shaffer 1981:70).

The Raw Materials Found Within the Sub-Region

The presence of copper and gold has already been noted (pp. 52–53).

Ordinary Stone

Quartzite and granite occur in the Narnaul and Khodana areas (Raghu Nandan et al. 1981:188).

Chart 12

PUNJAB AND HARYANA—HARAPPAN PERIOD

Raw Material	*Banawali*	*Rohira*	*Ropar*	*Kotla Nihang Khan*	*Mitathal*	*Rakhigarhi*	*Sirsal*	*Chandigarh*	*Dher Majra*	*Bahu*
Steatite	beads, seals	button	beads, seal	bangles	beads	beads		beads	beads	beads
Alabaster			cake						pestle	
Shell	beads, indeterminate objects		bangles	beads					beads	
Ivory	weights, gamesman				½ in fragment				bead	
Carnelian	beads	beads	beads	beads					beads	
Agate	beads, weights		beads		beads, core			beads	beads	
Jade									beads	
Lapis Lazuli	beads								beads	

(*Chart 12 Contd*)

Raw Material	*Banawali*	*Rohira*	*Ropar*	*Kotla Nihang Khan*	*Mitathal*	*Rakhigarhi*	*Siswal*	*Chandigarh*	*Dher Majra*	*Balu*
Copper/ Bronze	arrowheads, spearheads, chisels, fish hooks, razor blades, rings, hairpins, rods	chisels, arrowhead, blades	celts, spear-head, jar, ring, bangle, razor blades	pins, ring, rod	ring, wire, indeterminate objects, fragments		pieces	rings, wire, rods, clasps, bangle	frag-ments, beads, pin	arrow heads, frag-ments
Gold	beads, ornaments	micro-beads								
Precious & Semi-Precious Stone	Topaz beads. Smoky crystal piece								Emerald, beads. Crystal beads	
Ordinary Stone	Quartz beads. Chert blades, flakes, cores		Chert weights & cores	Chet blades, weights	Chert weights. Sandstone querns & pestles	Chert blades, bangles. Quartzite hammers			Granite balls. Quart-zite beads	Chert bang-les

The Raw Materials Available Outside the Sub-Region

RAJASTHAN

The occurrences of copper, gold, steatite and a number of semi-precious stones such as agate, have already been mentioned (pp. 49, 77–78, Chart 7).

Emerald

Significant occurrences of emerald are in Bhubani and Rajgarh located at the north-eastern end of the emerald belt of Rajasthan (Pareek 1984:71). Deep green transparent emerald also occurs at Hatondi and Mangaliawas (Pareek 1984:71). Minor occurrences have been reported from Kaklana, Lachhipura, Bithur and Chat. Emeralds also occur in the Aravalli region of Rajasthan (Bhattacharya et al. 1987:529). Here, nearly all the emeralds occur in Udaipur district in a narrow belt that stretches between Deogarh in the north to Kankroli in the south along the Mavali-Marwar junction railway (Bhattacharya et al. 1987:531).

SIND

The presence of chert and shell has already been noted (pp. 22, 28).

BALUCHISTAN

Lapis lazuli in Baluchistan has already been noted (pp. 20, 22–23).

CENTRAL ASIA AND CHINA

Jade occurrences have already been noted (pp. 78–79).

Discussion

The primary interaction of Punjab and Haryana seems to have been with Rajasthan, an area with which eastern Punjab was interacting since the pre-Harappan period as evidenced by the cultural affiliation of Siswal A pottery and Kalibangan or Sothi type pottery (Shaffer 1986:223). In the Harappan phase, interaction occurred not only with the mature Harappan sites such as Rakhigarhi and Mitathal but also with what Shaffer has called the local cultural settlements ie., Siswal B occupations and Rajasthan. Although copper occurs in limited quantities in Punjab and Haryana, the Harappan sites of the region could also have been drawing on the material reserves of Rajasthan for essentials like copper as well as for precious stones like emeralds. That Rajasthan was involved with Punjab and Haryana as a whole is also evident from the fact that the bulk of the pottery of Siswal B consists of Kalibangan fabrics.

Some luxury and non-utilitarian items from regions as far flung as Central Asia and China were also, however, finding their way

into this region. Afghanistan may also have provided some gold, silver and lapis lazuli to the region. Shell and chert came from Sind—the presence of sea shell artefacts in the repertoire of Ropar is noteworthy (Datta 1984:24, 27).

Gujarat

In the field of Harappan studies some of the most intense archaeological explorations and excavations have taken place in Gujarat. Apart from the work of the Archaeological Survey of India which conducted excavations under the leadership of S.R. Rao at Lothal and Rangpur, among other sites, the work of the University of Baroda at Nageshwar, Nagwada, Zekhada etc. is extremely important. The University of Pennsylvania has also done considerable work at the site of Rojdi. Much of this work has been extremely fruitful in the sense that Lothal today no longer stands in relatively splendid isolation but seems to be a part of a larger urban phenomenon which included a number of large and often very specialized urban centres.

The Sitewise Distribution of Raw Materials

The diversity of stones, metals, and other raw materials used at the Harappan sites of Gujarat is clear from a reading of Charts 13a-b.

These raw materials include steatite, alabaster, shell, ivory, carnelian, agate, jasper, lapis lazuli, copper/bronze, gold, silver, amazonsite, crystal, chrysophrase, bloodstone, milky quartz, opal, onyx, plasma, sard, sandstone, chert, granite, chalcedony, felspar, hornblende, syenite, schist and dolerite.

The Evidence of Manufacture of Finished Products at Different Sites

Steatite: That seals were locally manufactured at Lothal is fairly clear from (i) lumps of steatite and partially cut out blocks of steatite (Rao 1979–85:306), and (ii) a number of unfinished seals such as Nos. 5099, 15294, 6184. 12923, 5288, and 469 (Rao 1979–85: 311); some seals were unperforated while others were unfinished.

The manufacture of steatite beads at Lothal is exemplified by the presence of a large number of beads which were found embedded in the bead factory located in Block E (Rao 1979–85:580). A large dump of dehydrated lime which was found near the kiln in the above structure has been interpreted by Rao (1979–85:582) as being the residue of limestone which was used for dehydrating steatite there.

Chart 13 a

GUJARAT—HARAPPAN PERIOD

Raw Material	*Lothal*	*Rangpur*	*Surkotada*	*Somnath*	*Khar Ka Khanda*	*Pirwada Khetar*
Steatite	seals, beads, bangles, finger-rings, ear rings, ear stud, brooches, ear pendants, heart shaped ornaments, buttons, lid, rod	beads, ornaments	beads	beads		
Alabaster	gaming piece, arm of statue					
Shell	seal, gamesman, dice, beads, ladles, bowls, knife, engravers, scrapers, burnishers, needle, handle, compass, plectrum, bridge, bangles, rings, inlay, ear stud	beads, bangles, cores, columella, inlay, pend-ants, rim of vessel, spoons, gamesmen		bangles, bead	bangle pieces	bangle piece
Ivory	seals, stud, gamesman, beads, scale, knives, engraver, rods, awl, hairpin, ear stud, pendant, ear ornament, cut piece, tusk	beads	fragmentary comb, tusks			
Carnelian	beads, weights	beads	beads	beads		
Agate	seals, discoids, beads, weights	beads, weights	beads, weights	bead, microliths		
Jasper	lunates, blades, weights, cores	beads				
Lapis Lazuli	beads					

(*Chart 13 a Cont*)

Raw Material	*Lothal*	*Rangpur*	*Surkotada*	*Somnath*	*Khar Ka Khanda*	*Pirwada Khetar*
Copper/ Bronze	seal, ear ornaments, axes, spear heads, dagger heads, arrow heads, razors, chisels, drill bit, awls, rods, needles, plainer bit, nails, fish hooks, saw, bangles, rings, beads, figurines, chain,' spoon, jar, mirror	celts, bangles, finger rings, amulet, pin	celts, chisel, beads, bangles	celt		
Gold	beads, ear ornaments, ear pendant, nose ornament, head ornament, disk, microbead necklaces, foils, pieces	beads, dust on steatite ornament				
Semi-Precious Stone	Amazonite beads, weights. Chrysophrase beads. Bloodstone beads. Milky quartz beads. Opal beads. Onyx beads. Plasma beads. Rose quartz beads. Sard beads. Chalcedony weights, blades, lunates, cores. Felspar weights. Crystal beads				Chalc-edony cores	Chalcedony blades, flakes
Ordinary Stone	Sandstone anchors, pounder, querns, mullers, whetstones. Chert burnishers, weights, blades. Granite net sinker, crucible. Schist weights, bowl, whet-stone. Hornblende weights. Felspar weights. Amazonite weight. Syenite bowl	Sandstone, Schist & Dolerite artfacts	Chert blades & measures		Chert cores	Chert cores

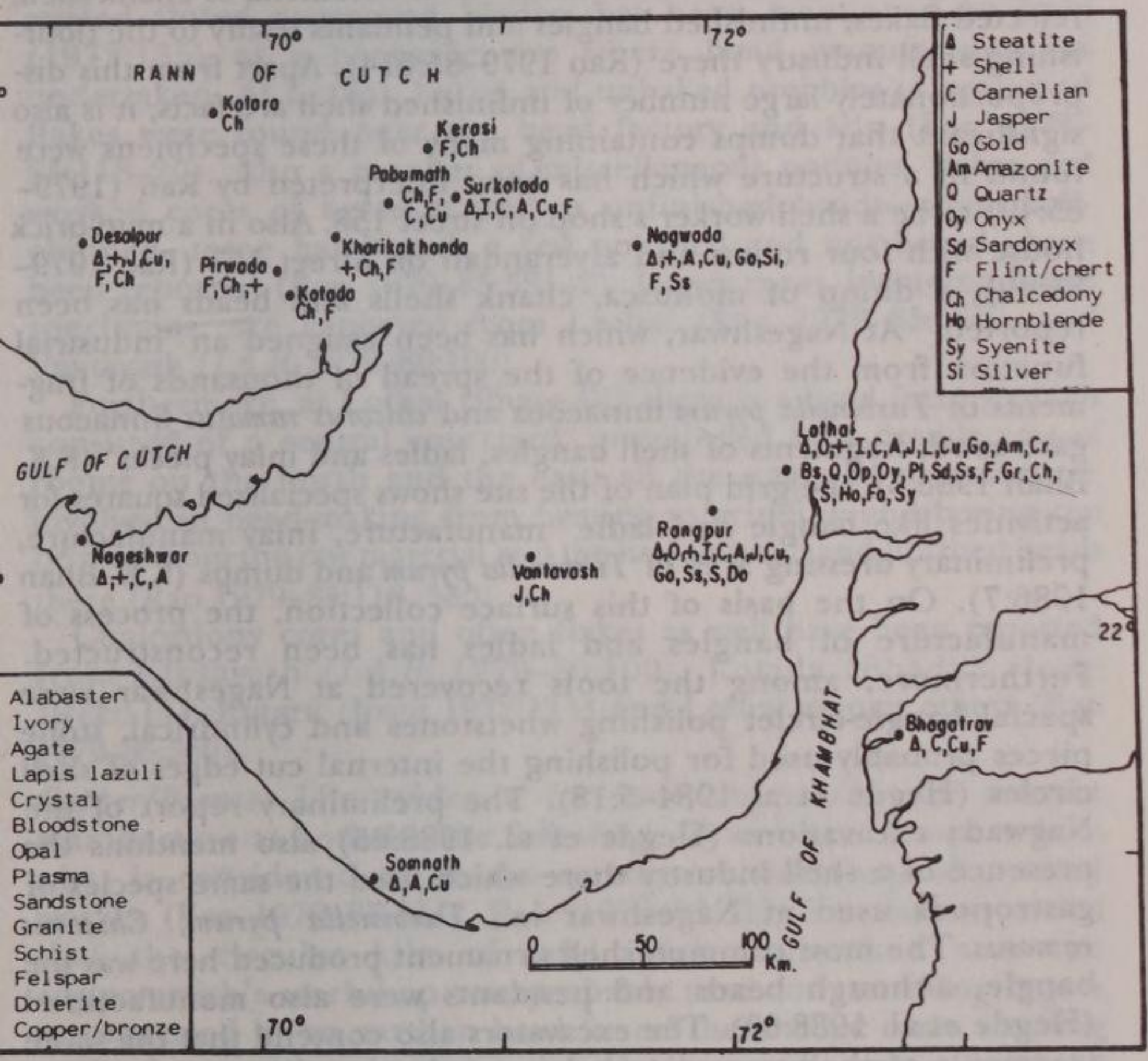
Note: Somnath: Nanavati et al. (1971: 17) while drawing a distinction between Period I (Prabhasa Ware) and Period II (Lustrous Red Ware) do not provide the stratigraphic details of the same. Hence, this chart and Chart 18a (late Harappan period) overlap in details.

Chart 13 b

GUJARAT—HARAPPAN PERIOD

Raw Material	*Nagwada*	*Nageshwar*	*Pabumath*	*Bhagatrav*	*Vantavash*	*Kotada Bhadli*	*Kotara*	*Desalpur*	*Kerasi*
Steatite	beads	beads	seal	bead				seal, beads	
Shell	circlets, bangles, beads, pendants, inlay	fragments, bangles columella, pendants, beads					bangles	bangles	
Carnelian		beads,	bangles, beads	beads					
Agate	beads	weight						weights	
Jasper					cores				
Copper/ Bronze	celt, chisel, pendant, rings, strips		artefacts	indeterminate objects			seal, knives, chisel, beads, bangles		
Gold	ornament folded sheet, wire								
Silver	ornaments								
Ordinary Stone & Chalcedony	Chert drills, blades. Sandstone querns, pestles		Chert blades & flakes. Chalcedony beads,weight	Chert blades	Chalcedony cores & blades	Chalcedony blades, cores. Chert blades	Chalcedony blades, cores. flakes	Chert flakes. Chalcedony points & arrowheads	Chert blades

Map 10



SITEWISE DISTRIBUTION OF RAW MATERIALS IN GUJARAT IN THE CONTEXT OF THE HARAPPAN CIVILIZATION

Shell: A number of sites have provided impressive evidence of local shell manufacture. At Lothal, hundreds of columella of chank-shell, rejected flakes, unfinished bangles and pendants testify to the flourishing shell industry there (Rao 1979–85:614). Apart from this disproportionately large number of unfinished shell artefacts, it is also significant that dumps containing many of these specimens were found in a structure which has been interpreted by Rao (1979–85:49) to be a shell worker's shop on street 158. Also in a mud-brick house with four rooms and a verandah on Street 157 (Rao 1979–85:49), a dump of mollusca, chank shells and beads has been reported. At Nageshwar, which has been assigned an 'industrial function from the evidence of the spread of thousands of fragments of *Turbinella pyrum* linnaeous and *chicorus ramosus* linnaeous gastropod, fragments of shell bangles, ladles and inlay pieces' (K.K. Bhan 1986:6), the grid plan of the site shows specialized squares for activities like bangle and ladle manufacture, inlay manufacture, preliminary dressing area of *Turbinella pyrum* and dumps (K.K. Bhan 1986:7). On the basis of this surface collection, the process of manufacture of bangles and ladles has been reconstructed. Furthermore, among the tools recovered at Nageshwar were special bangle-circlet polishing whetstones and cylindrical, stone pieces probably used for polishing the internal cut edges of shell circles (Hegde et al 1984–5:18). The preliminary report of the Nagwada excavations (Hegde et al. 1988:65) also mentions the presence of a shell industry there which used the same species of gastropods used at Nageshwar ie., *Turbinella pyrum, Chicorus ramosus.* The most common shell ornament produced here was the bangle, although beads and pendants were also manufactured (Hegde et al. 1988:60). The excavators also contend that the waste fragments of shell were recycled to produce a variety of tiny, flat, geometric forms which could be inlay pieces (Hegde et al. 1988:60). At Rangpur also, rejected cores and columella have been recovered from period IIa (Rao 1962 & 1963:149).

Ivory: Three pieces of ivory, two from Period A and one from an unstratified level, are reported from Lothal (Rao 1979–85:631). One elephant tusk was found in Period A; this is partially cut, possibly for further working and was, incidentally, found in what Rao calls the 'ivory worker's shop' in the Acropolis area, Phase III (Rao 1979–85:631). From Surkotada, elephant tusks are reported from the last period of occupation (Joshi 1972:135).

Semi-Precious Stone: In the 'bead factory', hundreds of carnelian beads in various stages of manufacture, rejected cores and flakes as well as a jar containing finished specimens were found (Rao 1979–85:118). Also, in the vicinity of the bead kiln, finished beads of carnelian, among other artefacts, were recovered (Rao 1979–

85:120). At Surkotada, an area about 200 m away from the main mound, which was strewn with nodules of semi-precious stones, wasted fluted cores and blades, has been mentioned by Joshi (1972:135) as a probable site where bead manufacture was undertaken. At Lothal, baked and unbaked prebbles of agate and flakes were found near the bead factory and kiln (Rao 1979–85:118–20). Also a number of miscellaneous nodules, flakes and worked cores of agate as well as unfinished beads—some half-chipped, some half-bored, a few polished and not bored—have been reported (Rao 1979–85:581–2). Jasper cores, including fluted specimens, are reported from Lothal (Rao 1979–85:560), and Vantavash (*I.A.R.* 1979–80:100).

Furthermore, at Lothal (Phase IV) there is a bead factory which consisted of a central courtyard, surrounded by a double row of rooms on the north and the east; all the stages of manufacture involved in bead-making from heating to grinding and boring can be seen from the raw material and the half-finished and finished beads there (Rao 1979–85:118, 580).

Chalcedony cores and often flakes as well have been reported from Vantavash (*I.A.R.* 1979–80:100), Kotada (Bhadli) (Joshi 1972:114), Kotara (Joshi 1972:111) and Lothal among others (Rao 1979–85:560).

Copper/Bronze: The evidence for local copper/bronze artefact manufacture at Lothal is the following: (i) an ingot of copper from what is considered to be the quarter or workshop of a metal worker (Rao 1979–85:311). Rao (1979–85:522) has also contended that the circular kiln of mud bricks unearthed near the coppersmith's workshop was probably used for remelting ingots, as suggested by an earthen bowl found there. That some smelting took place in the above-mentioned kiln seems certain from the large sheets of metallic copper which have been recovered in the form of flattish chunks from the area and from the mud plaster on the inner surface of the walls which have got vitrified due to intense heat; (ii) the presence of a coppersmith's workshop, identified on street 154 where a cubical anvil of sandstone bearing use marks, a copper chisel and two terracotta crucibles were found; (iii) a smithy area (Rao 1979–85: 49) containing five miniature bath-like sinks interconnected with drains and paved with burnt bricks; (iv) two rectangular slabs of sandstone with groove-like depressions which were used, in the opinion of Rao, for casting pins and needles of copper and bronze. Lothal, incidentally, has yielded a number of wire-like pins and needles (Rao 1979–85: 555).

Ordinary Stone: Chert flakes have been reported from Lothal (Rao 1979–85:574), Desalpur (Joshi 1972:105) and Kerasi (Joshi 1972:108).

The Raw Materials Found Within the Sub-Region

The presence of agate, jasper, carnelian and other varieties of semi-precious stones as well as marine shells has alrady been noted (pp. 79–81).

Steatite

Significant deposits of steatite are reported from the Sabarkantha district (Rajyagor 1974:18). The main occurrences are in the Kundol valley (Devnimori, Kundol, Isri), where the steatite is soft, homogeneous in texture and occurs in bulk, and pockets south of Dadhalia, Bhasmer and Thuravas. Small exposures of steatite are also seen near Ghanta and Mora. Low-grade steatite also occurs in the Panchmahals district (Patel 1972a:16).

Alabaster

Large resources of gypsum occur in the Junagadh district (Rajyagor 1975:20–3).

Ivory

Although the elephant is extinct in Gujarat, Rao (1979–85:324) has argued for its existence in Western India on the basis of (i) a reference in the *Arthasastra* of Kautilya to the short stature of the elephants of Saurashtra; (ii) the presence of an ivory tusk and humurus of the elephant at Lothal.

Amazonite

Rao (1979–85:586) noted a source of amazonite in Palanpur in north Gujarat.

Copper

The existence of copper mineralization in Gujarat has been discussed briefly in the Gujarat state gazetteers of the Panchmahals and Sabarkantha districts (Patel 1972a; Rajyagor 1974). Chart 14, however, relies primarily on the Geological Survey Publication which contains a number of details on the mineralized belts (Raghu Nandan et al. 1981: 57–61).

Radio-carbon dates and literary references testify to the existence of an ancient mining indutry in the Ambamata area from about the first century BC to the 11th-15th centuries AD when it was in a flourishing state. Ancient workings go down to 480 m R.L. in the central part and large dumps of slag in the area from Ambaji to Kumbaria are about approximately 0.6 million tonnes, covering a distance of 0.23 sq km.

Chart 14

COPPER RESOURCES OF GUJARAT

Serial No.	*Mineralized Belts*	*Location*	*Old Workings*
1.	*Deri-Ambamata Belt* strike length of 8–10 km trending NW-SE over a maximum width of 700m	Banaskantha district to Sirohi in Rajasthan	large dumps of slag in area from Ambaji to Kumbaria (0.6 million tonnes estimated over 0.23 sq km)
2.	*Kui-Chitrasani Belt* strike length of 45 kms, along a fault zone trending NE-SW	Chitrasani in Banaskantha district to Kui in Sirohi district, Rajasthan	
3.	*Champaner Belt*	Panchmahals & Baroda districts	
4.	*Native occurrences* Deccan traps	Jamanagar, Bulsar & Rajkot districts	

Gold

M. Ziauddin and S. Narayanaswami (1974:96) noted gold occurrences in the following districts:

Baroda district: Gold is reported to occur in association with galena near Barkunda in the Chota Udaipur taluk—a sample of 3 per cent lead contained 7 ppm of gold;

Jamnagar district: The Alech hills, south-east of Satapur apparently contain gold.

Among other streams, gold was collected from the sands of the Sonrekha river (a stream flowing between the Girnar hills and Junagadh), albeit with very little profit. (Habib 1982: Notes to Sheet 7b).

Ordinary Stone

All the ordinary stones such as granite-gneiss, schist, limestone, chert, flint, dolerite, and so on were found within the region.

Rajkot district: Significant quantities of sandstone and limestone occur in this district (Trivedi 1965:5–7).

Junagadh district: Limestone, sandstone and dolerite are found here (Rajyagor 1975:20, 18).

Panchmahals district: Limestone, sandstone, and granite are known to occur in this district (Patel 1972a: 16–18).

Surendranagar district: Limestone, sandstone and dolerite are found here (Patel 1977: 12–15).

Broach district: Limestone and sandstone occur here (Palande 1961: 13, 12,).

Kheda district: Limestone, chert, sandstone and granite occurrences are reported from here (Rajyagor 1977:20, 21).

Amreli district: Significant limestone deposits are located in the coastal areas with the thickness varying from a few metres to as much as 30 metres (Patel 1972b:16).

Bhavnagar district: Limestone, chert and flint are available in large quantities near Lakhanka, between Badi-Chhaya and Rampur (Trivedi 1969:20–1).

Kutch district: Important limestone deposits are found here (Patel 1971:24–5).

Sabarkantha district: Sandstone, limestone, granite and dolerite are reported from this district (Rajyagor 1974: 19, 20).

Vadodara district: Granite occurs in a wide stretch of area till the borders of Madhya Pradesh (Rajyagor and Tripathy 1979:21).

The Raw Materials Available Outside the Sub-Region

MAHARASHTRA

Gold

Gold is reported from two districts (Ziauddin and Narayanaswami 1979:102–103, 137–8; also Reddy 1981:39–41).

Bhandara district: The Geological Survey of India is known to have found three auriferous quartz veins at Kolari, Mokhahari and Pular near Bhiwapur. Alluvial gold is reported in the Maru stream at Ambagarh, near Thirora on a tributary of the Wainganga and in the bed of the Son Dhodha stream:

Nagpur district: Some placer gold from the sands of a small stream called 'Dabari Pat' at a place 1.6 km north of Pular is said to have been extracted. The Sonajhari people are also known to pan the sands of the Maru river and its tributaries after the monsoons for gold.

BALUCHISTAN

The presence of lapis lazuli has been noted (pp. 20, 22).

RAJASTHAN

The presence of silver in Rajasthan has been noted (p. 78).

SIND

The occurrence of chert in Sind has been mentioned (p. 28).

Discussion

It has generally been supposed that Lothal was significantly dependent on trade for the basic raw materials, an orientation

which is underlined by the presence of a dockyard and a warehouse at the site. The areas and raw materials mentioned by Rao (1979–85:221) in this regard are : (i) gold from the Hatti or Kolar mines in Mysore state, (ii) chert from either Sind or the Bijapur district of Karnataka, (iii) steatite from the south and (iv) copper from the mines of Oman and the Persian highlands. Even a brief overview of the resource-bearing areas in Gujarat, however, gives the impression that such arguments are exaggerated. Among other raw materials, steatite, chert, a large variety of semi-precious and ordinary stones and even insignificant quantities of gold were available within the region itself. In fact, some raw materials such as copper, agate, chalcedony, limestone and so on were fairly widespread in occurrence.

In addition to postulating a non-local source for copper, Rao (1979–85:524) has attached considerable importance to the presence of a bun-shaped ingot found at Lothal which constitutes evidence, in his opinion, of tht metal being of external origin. Alternatively, it can be argued that this ingot may only represent a stage in the preparation of a metal artefact. In an important anthropological study of indigenous metalcraftsmen in India, Meera Mukherjee (1978:167) refers to the local traditions of preparing metal objects from ingots and also cites actual practices. To give only one example, in Kota Padu, Andhra Pradesh, an ingot is first prepared for making a bowl called Kancho Ginni (Mukherjee 1978: 206–98):

> for this purpose, delta clay is collected in a heap. The brass pattern for the ingot, 7 1/2 cms in diameter, is pressed on the clay to bake an impression of the pattern. This done, the brass pattern is removed and molten metal is poured into the impression. The metal solidifies in a few minutes. This is the ingot.
>
> Several ingots are made, one after another. From the point of view of the operation, it is more convenient to work with a red hot ingot soon after it is made. But for reasons of economy, several impressions are made in a row.

The only raw material which was probably imported to Gujarat in some quantity was gold. This was readily available from the Maharashtra plateau. In any case, by the second millennium, Maharashtra was very much a part of the protohistoric picture with chalcolithic sites yielding Savalda ware at a number of places such as Daimabad, Sarangkheda, etc. Interaction between the Savalda culture and the Harappan sites of Gujarat is most likely especially in the light of the emergence of important late Harappan protohistoric horizons in Maharashtra. Some amount of lapis lazuli and turquoise was coming to Lothal from the general direction of Baluchistan and Sind, that could have been either mediating Afghan/Iran sources or/and the Baluchistan deposits.

Baluchistan

While Baluchistan was not briştling with Harappan sites, the work of George Dales (1962) at the sites of Sutkagen-Dor and Sotka Koh on the Makran coast and Balakot in the Karachi bay (Dales 1979), and the recent excavations at the site of Nausharo, six kms from Mehrgarh, by the French Archaeological Mission (Jarrige 1974–86) clearly indicates that Baluchistan was not a peripheral region in any sense. Impressive centres such as Nausharo, Dabarkot and Balakot were flourishing. Harappan remains have also been noted at Periano Ghundai, Kaonri, Sinjawi, Spina Ghundai and Quetta Miri (Mughal 1972: 141, 144, 149).

The Sitewise Distribution of Raw Materials

The raw materials used for the production of diverse artefacts at Baluchistan are clear from a reading of Chart 15. Briefly, these raw materials are steatite, alabaster, shell, ivory, carnelian, agate, copper/bronze, onyx, flint, diorite, and marble.

Chart 15

BALUCHISTAN—HARAPPAN PERIOD

Raw Material	*Nausharo*	*Balakot*	*Suthagen Dor*	*Periano Ghundai*
Steatite	beads, inlay, seal	seals		
Alabaster	bangles, fragments		base of cup, bowl	cups
Shell	bangles, shells, ladle	wasters, bangle fragments, implements	bangles	bead, necklaces
Ivory	rod	objects		
Carnelian	beads			
Agate	beads			
Copper/ Bronze	fragments, arrohead, blades, lump dagger, chisels, circular object, razor, balls, seal, spiral headed pin, chisel, ring, button		indeterminate fragments, barbed object, bead, needles, knife	objects
Semi-Precious Stone	onyx vase	miscellaneous objects	onyx bead	
Ordinary Stone	Flint blades, hammer stones, flakes, mortar, pestle. fluted core. Diorite polisher. Marble bowl	Flint, Chert tools	Flint tools, arrowheads	Flint blades

The Evidence of Manufacture of Finished Products at Different Sites

Steatite: Jarrige has considered the possibility of steatite bead manufacture at the site of Nausharo. Although steatite beads are found at a number of loci at Nausharo (Jarrige 1974–86: Locus II, 93, NS–PSF), the only cluster of beads, going into several thousands, was found in a niche on the eastern wall of locus I; Jarrige (1974–86:84) has suggested that this cluster was 'probably related to a process of production though no waster of any sort can be put in relation with the firing of steatite'.

Shell: Impressive evidence of a local shell bangle industry at Balakot has been unearthed, the details of which have been extensively published (Dales 1979; Meadow 1979; Durante 1979). Apart from the chank shell *Turbinella Pyrum*, the Balakotian shell industry was distinguished by the use of the bivalve *Meretrix casta* (Dales 1979:269). The evidence for local working includes: (i) working floors covered with large quantities of shell bangles, in all stages of manufacture (Dales 1979:268–9). A number of grinding and chipping stones associated with shell artefact manufacture were also found on these floors; (ii) roughouts and working wasters consisting basically of fragments of wall and of the upper parts of the shells near the apex, bearing traces of working to remove the latter (Durante 1979:328); (iii) three unutilized shells. Silvio Durante (1979:317–44), on the basis of the marine shell remains at Balakot, has postulated four stages in the working of *Turbinella Pyrum*. At Nausharo, several 'unio' shells have been found (Jarrige 1974–86:88).

Copper/Bronze: In the Nausharo excavations, although no definite evidence of metalcrafting was found, five fragments of vitrified walls of a circular firing structure were found outside locus II in sq. NS. PSF, which indicate, in the opinion of the excavators (Jarrige 1974–86:86) some activities other than cooking. Also in Locus I (Jarrige 1974–1986:84), a small and thick container in coarse, baked clay with the shape of a crucible was found; however, no copper traces were visible in the container.

The Raw Materials Found Within the Sub-Region

The occurrences of ordinary stone, copper, agate, and steatite have already been noted (pp. 18–20, 21–24). Onyx, which is a sub-variety of agate, in all probability, was also present in Baluchistan.

Shell

Meadow (1979:295–6) mentions that both *Turbinella Pyrum* and *Callista* (*meretrix*) were available locally, inhabiting the sandy lower

tidal zone of shallow bays. He also pointed out the rarity of abraded specimens from Balakot which suggested that *Callista* was collected fresh. Kenoyer (cf. Meadow 1979:295) has also suggested that *Turbinella Pyrum* is native at least as far west as the Karachi area.

Alabaster

The Gazetteer of Makran (Hughes-Buller 1907:27) has mentioned important deposits of gypsum in the hills fringing the coast.

The Raw Materials Available Outside the Sub-Region

SIND

The presence of semi-precious stones, chert, flint, ivory has already been noted (pp. 28, 46, 75, Chart 3).

GUJARAT

The presence of carnelian in Gujarat has already been noted (p. 79).

Discussion

The Harappan sites of Baluchistan were oriented inwards towards the Indus valley and Sind. In our section on Sind, we have already mentioned the plethora of raw materials used by the sites of the region which probably came from Baluchistan. Certain finished products like carnelian beads and the fragment of the marble bowl, which is identical to the Mohenjo-daro specimens, were probably imported from Sind itself.

Manda

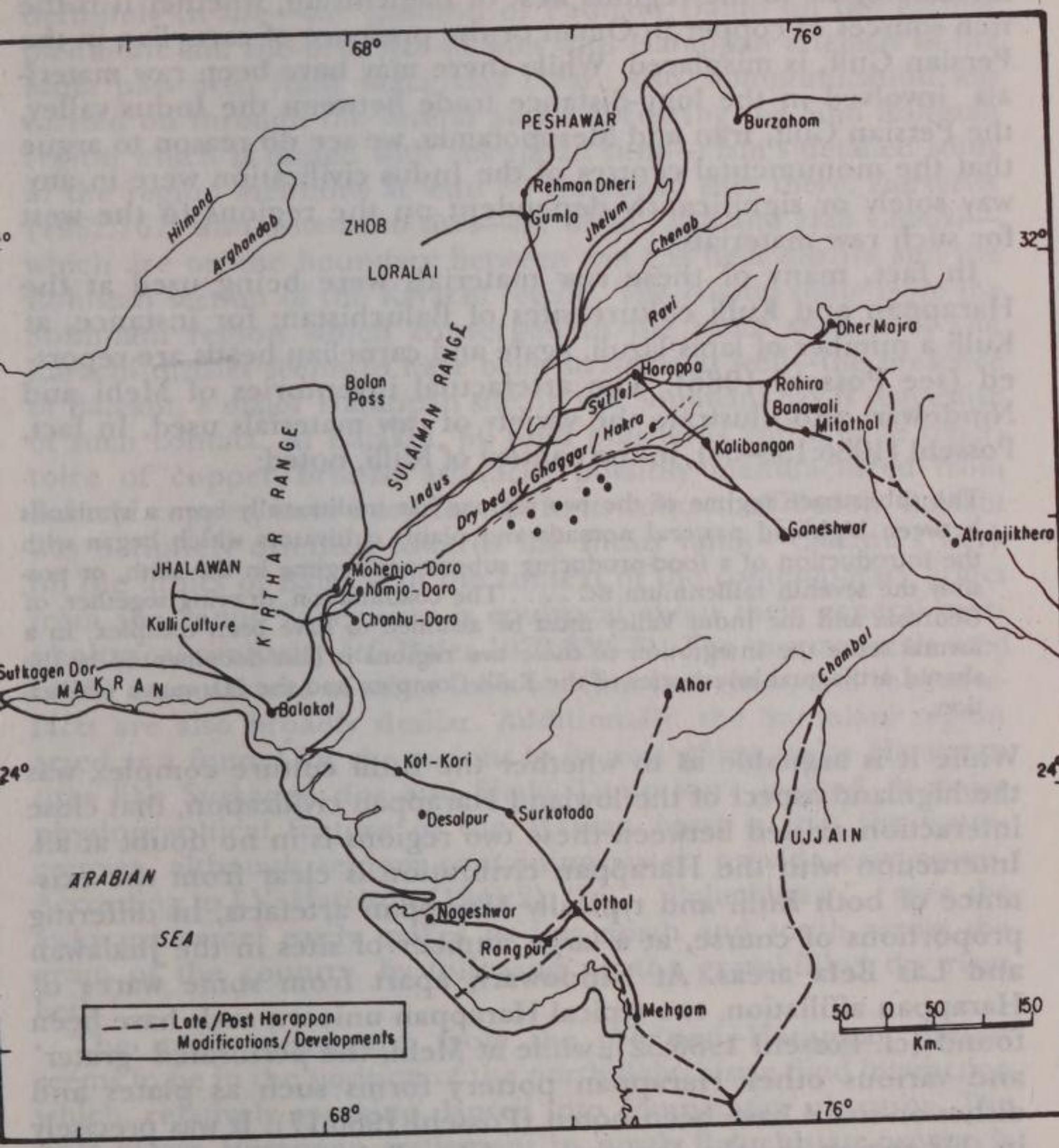
At Manda, near Akhnoor, a copper double spiral-headed pin with, in the opinion of the excavators, West Asian affinities (Joshi and Madhu Bala 1982:187) and chert blades, among other artefacts were recovered.

INTERNAL TRADE ROUTES

Sind—Baluchistan

A careful perusal of the data makes it reasonably clear that a major communication axis existed between south Baluchistan and Sind. In this context, we have already discussed at length the large number of raw materials which were being exploited in the respective source areas of Baluchistan for use in the lower Indus valley—copper, lead, jasper, agate, and silajit are some such possible resources.

Map 11



INTERNAL TRADE ROUTES IN THE CONTEXT OF THE HARAPPAN CIVILIZATION

Clearly, the importance that has been attached by South Asian archaeologists to the regions west of Baluchistan, whether it is the rich sources of copper in Oman or the presence of carnelian in the Persian Gulf, is misplaced. While there may have been raw materials involved in the long-distance trade between the Indus valley, the Persian Gulf, Iran and Mesopotamia, we see no reason to argue that the monumental centres of the Indus civilization were in any way solely or significantly dependent on the regions to the west for such raw materials.

In fact, many of these raw materials were being used at the Harappan and Kulli culture sites of Baluchistan; for instance, at Kulli a number of lapis lazuli, agate and carnelian beads are reported (see Possehl 1986). The artefactual inventories of Mehi and Nindowari also illustrate the variety of raw materials used. In fact, Possehl (1986:158–60), in the context of Kulli, noted:

> The subsistence regime of the two regions has traditionally been a symbiosis between highland pastoral nomads and plains cultivators which began with the introduction of a food-producing subsistence regime in the sixth, or possibly the seventh millennium BC . . . . The coadunation, drawing together, of Gedrosia and the Indus Valley must be assumed to have been complex. In a formal sense the integration of these two regions is best documented by the shared artifactual inventories of the Kulli Complex and the Harappan Civilization. . . .

While it is arguable as to whether the Kulli culture complex was the highland aspect of the lowland Harappan civilization, that close interaction existed between these two regions is in no doubt at all. Interaction with the Harappan civilization is clear from the existence of both Kulli and typically Harappan artefacts, in differing proportions of course, at a large number of sites in the Jhalawan and Las Bela areas. At Nindowari, apart from some wares of Harappan affiliation, two typical Harappan unicorn seals have been found (cf. Possehl 1986:52), while at Mehi, the perforated 'grater' and various other Harappan pottery forms such as plates and dishes-on-stand have been noted (Possehl 1986:17). It was precisely in this region ie., the Jhalawan and Las Bela provinces where we find the commingling of Harappan and Kulli artefactual material, that rich resources such as copper, lead, agate, jasper and silajit were available. In Jhalawan, a major concentration of such sites occurs in the Ornach valley—Nindowari, Kinneru, Karez Damb and Phusi Damb are some of the well known sites. In the Las Bela district, such sites occur in the Welpat region—LBI, LBI6, LB13—with one major site, Niai Buthi, near the district capital, Bela.

The main arteries of communication between south Baluchistan and Sind were several—there were routes running west to east from Jhalawan and Las Bela into Sind as well as routes from Karachi to Sonmiani, Las Bela and further north. Many of these

routes have been discussed in Chapter 2. The Mula pass route was definitely in use—the position of Pathiani Damb on the Kirthar piedmont and the presence of sites with Harappan artefacts in the Mula pass area itself make this clear. Also, communication was carried on through the several passes bordering the Sind Kohistan region which is dotted with Harappan sites—Flam's detailed study of the region mentions at least 30 Harappan sites there. Fairservis (1982:167) also noted two sites—Pir Shah Jurio and Hab Chauki—which are on the boundary between the Las Bela district and the Kohistan section of the Karachi region. The coastal route from the Sonmiani region which converged in the same section of the Karachi district seems to have been strategic as well—the presence of Balakot, a major Harappan site, in the Sonmiani bay is suggestive of such contact. At Balakot, 66 Kulli potsherds and a large repertoire of copper/bronze artefacts, possibly manufactured from Baluchi copper, have been found. In its cultural affiliation, Balakot was definitely oriented towards the Indus valley—Cleland's work on the lithics of Balakot in the context of the contemporary lithics from the Indus Valley sites is equivocal about their general morphological similarity (cf. Dales 1979:252–3). The raw materials used in the manufacture of stone tools ie., flint and chert, and shell artefacts are also broadly similar. Additionally, the Sonmiani region acted as a funnel for the regions to its west where major Harappan sites like Sutkagen dor and Shahi Tump were located. A major physiographical feature of the Makran coast is that the watercourses, although seldom containing water, provide easy access. According to J.V. Harrison (1941:2), 'In . . . Baluchistan . . . even the awkward camel easily makes its way north and south across the grain of the country, by following up the gravel-filled dry river beds.'

The major departure, from the pre/early-Harappan period seems to be in the position of the north Baluchistan-Sind interaction which, relatively speaking, lapsed into comparative obscurity. The only major Harappan settlement in north Baluchistan proper is Dabar Kot. At Periano Ghundai and Kaonri, Harappan remains are concentrated at only one edge of the settlement (Mughal 1972a:139). In the Quetta district also, there is a striking scarcity of Harappan remains (Fairservis 1956:355). The situation is a little better in the Bolan Pass area where, at Kirta and Takt-i Mir (Enault and Jarrige 1973:190–3). Harappan ceramic types have been noted. More significant is the large settlement of Nowsharo, a few kilometres off Mehrgarh which probably articulated the exploitation of steatite from north Baluchistan and copper, lapis lazuli and turquoise from the Chagai region into Sind. In this context, the large number of steatite artefacts found there seem to be signifi-

cant. Its role in articulating trade from the Chagai region is slightly problematic, however, not only in the light of the relative scarcity of sites with Harappan affinities in the Quetta valley but also in the complete absence of lapis and turquoise objects at the site. However, the South Cemetery at Mehrgarh (Period VIII) has yielded a number of beads of lapis lazuli, as well as a small gold pendant set with turquoise and lapis lazuli (Santoni 1984:52), in addition to bronze vessels. Moreover, copper which occurs in the shape of a variety of artefacts at Nowsharo could have been procured from Chagai. From Chagai the route which is normally followed to Sind is the Nushki-Quetta-Bolan road and, in a sense, Nowsharo's position in the Bolan pass region on this time-honoured route is significant.

Coastal Sind—Upper Sind—Central Indus Plains

The postulate of a trans-regional axis from the Karachi coast, cutting across the Sind plains towards the Bari *doab*, probably going towards the northern highlands can be validated on the basis of several kinds of data. Firstly, Sind with its large monumental centres, Mohenjo-daro and Juderi-jo-daro being the most well known examples, was one of the core zones within the spatial spread of the Indus civilization and it is likely that it intermeshed, through trade and other cultural contacts, with other urban centres of similar magnitude in contiguous zones such as the central Indus plains city of Harappa. Secondly, at a large number of sites such as Mohenjo-daro and Chanhu-daro in inner Sind, large-scale shell working was undoubtedly being undertaken, for which the raw material was being procured from the Sind coastline. Such gastropods, in a finished and unfinished state, were reaching Harappa from the Rohri hills. Thirdly, certain raw materials such as flint, in a finished state, were reaching Harappa from the Rohri hills. Fourthly, considering the impressive workings of steatite, bead, copper/bronze, alabaster, weights and different stone artefacts at centres such as Harappa, Mohenjo-daro, Chanhu-daro, Allahadino etc. and the presence of artefacts in these materials at a number of smaller sites throughout Sind, it is most likely that such products were reaching them from the larger sites. Finally, although the exact significance of the maritime trade of the region is controversial, that some seaborne trade was taking place is undoubted and elements of it reached into Harappa, following the basic orientation of the routes linking the coast and the inner Indus plains.

There were several routes connecting the coast to the lower Indus and upper Indus plains. The Indus river would have been as it became since then, as important channel of communication. Aitken (1907:38) in his discussion on the trade of Sind, admitted that

'before there were any railways in India, a river like the Indus seemed to give to the Province that possessed it an advantage which defied competition'. However, he pointed out certain major obstacles in this, such as the fact that the navigation of its mouths was dangerous and also that its currents were so strong that the passage of boats going upstream was extremely slow. We may also mention in this regard the observations of Alexander F. Baillie (1890) who, in a major work on Karachi, noted that whereas the riverine route (in which, of course, camels carried goods for a brief span from Gharra to Jerruck where they were again embarked on the Indus) took $21^1/_2$ days at the cost of Rs. 52, by the direct road to Sehwan the journey by camels took 12 days at the cost of Rs. 7 per camel. There were several overland routes connecting southern Sind to the northern regions. An old trade route went north from Karachi to Thano Bula Khan and entered Larkana district north of the Laki range. This route was undoubtedly significant in this period considering the cluster of sites all along it from Karachi district, where there was a concentration of sites around Allahdino, to Karchat, Amri, Ghazi Shah, Ali Murad, Lohumjo-daro to Mohenjo-daro in the Larkana district. That the route went up to the Sukkur-Rohri hills, an important source of flint, is also undoubted. In fact, the normal trunk road in the early twentieth century (Smyth 1919a:20–1) from the Karachi coast entered the Sukkur district from both the right and the left banks of the Indus river and then continued to Multan, in which general area Harappa was located in the third-second millennium BC.

We do not think that any significant routes followed the eastern bank of the Indus river in the light of the paucity of sites there. At the same time, although there are hardly any sites in lower eastern Sind, higher up Chanhu-daro, Kot Diji and Naru Waro Dharo do show evidence of coastal and inter-regional contact. It is our contention that the Indus was crossed around these points by numerous ferries. Ferry crossings even in the early part of the present century were numerous. In the Nawabshah (Smyth 1920a:14), Hyderabad (Smyth 1920b: 17), Sukkur (Smyth 1919a:23) and Larkana districts (Smyth 1919b:22), among others, there were ferries at regular intervals on the Indus river, which were controlled by the local boards; the receipts were evenly divided between the two districts which were connected by the ferry. Sometimes, even within one district, ferries were established at a number of points. For instance, in the Sukkur district, the district gazetteer (Smyth 1919a:23) mentions the existence of ferry crossings at Rohri, Pano Akil, Ghotki and Ubauro talukas, whose respective rights incidentally were sold annually by auction. In fact, Chanhu-daro, in the Nawabshah district, seems to have been an important point along

which trade from Sind to Punjab and further north was mediated. This is evident from the plethora of raw materials exploited at the site, and from the large number of specialized manufacturing activities conducted there which, incidentally, covered a larger absolute area at the site then even at Mohenjo-daro. The strategic location of Chanhu-daro is clear from a reading of Mackay's excavation report (Mackay 1943:v):

> The three ancient mounds of Chanhu-daro are situated a little over half a mile south of the modern village of Jamal-Kirio, near Sakrand in the Nawabshah District of Sindh. The left bank of the river Indus is now twelve miles distant, but in the third millennium B.C., the river, or a branch of it, flowed close beside the city . . . . The Khirthar Mountains, in Baluchistan, some thirty-seven miles distant from the mounds, are crossed by a pass which is used by caravans to this day, as there is plentiful supply of fresh water. The ancient city was therefore very favourably situated for trade both by land and sea.

From Chanhu-daro the route probably followed the banks of the Indus till it reached the Bahawalpur tract, after crossing which Harappa was reached. Although Kot Diji, another large centre, is located higher up, appearing almost opposite Mohenjo-daro on the map, its limited artefactual repertoire suggests that, by the Harappan period, it was not playing a major role in the trade network.

Indus Plains—Rajasthan

Contentions about the importance of the communication nexus between the Indus plains and Rajasthan have centred primarily around the direct and indirect exploitation of the vast copper resources of the latter region in the Harappan period (Asthana 1982:277; Gupta 1984:419); whatever limited metallurgical analysis has been done on the Khetri copper deposits clearly suggests that Rajasthan copper was being exploited by the monumental centres of the Indus civilization (Agrawal 1971:175). Along with copper, some silver, possibly gold and lead as well, and semi-precious stones from Rajasthan were also being procured. The Ganeshwar-Jodhpura complex in the Khetri region, which included within its ambit a large number of specialized protohistoric copper smelting sites (see p. 154), is also significant. In fact, an examination of many of the illustrations of arrowheads of the barbed variety, spearheads and fish hooks shows a number of general stylistic affinities between Ganeshwar copper objects and those from Harappan sites (Agrawala and Kumar 1982:125). Ganeshwar is approximately 250 km from Kalibangan and 160 km from Bhadra in the Ganganagar district of Rajasthan. It is also extremely significant that Harappan pottery has been found at Dadiya Pajyali in the Sikar district and at Chava Siri in the Jhunjhunu district, both of which are located very

much in the Ganeshwar/Jodhpura cultural zone (*I.A.R.* 1980–1:62). Furthermore, the presence at Sabania in Bikaner, of two copper celts inscribed with the Indus script is decidedly suggestive of the presence of Harappan contacts (Agrawala and Kumar 1982:131). The Indus plains, in turn, were providing flint and to a limited extent, shell to the Ghaggar-Hakra region (through which, we shall argue, was the main line connecting Rajasthan and the regions to the west). We may also mention that Stein (cf. Dalal 1980:15) is supposed to have located, at Ahmedwala Ther, a Kulli type brazier and a round flat base supporting a censer of Mehi type.

The field research programme, under the guidance of Mughal (1982) in the Cholistan desert tract, suggests that the main route of communication between the Indus plains and the regions to the east including Rajasthan was through this strip itself. The Hakra river was probably perennial in the 4th and 3rd millennium B.C.; the presence of over one hundred and seventy two sites with mature Harappan occupation levels on a stretch of the river suggests its importance. On the Indian side, at least twenty-eight Harappan sites have been discovered in the Hanumangarh-Ganganagar area, most of them clustered along the dry bed of the Ghaggar river (Joshi et al. 1984:522). Many of these sites in this tract were extremely large, two of them approaching the size of Harappa and one site, Gamveriwala, at 81.5 hectares, being about the size of Mohenjo-daro (Mughal 1982:92). Equally significant is the fact that 45.4 per cent of these sites have been typified as 'industrial' sites. Many of these industrial sites, incidentally, seem to have been involved in copper smelting—for instance, Siddhanwala Ther, near Fort Derawar, yielded not only a copper ingot but also numerous kilns.

At this juncture, we may note tht the historical importance of the Bahawalpur tract need not be seen only in terms of the possibility of a perennial river flowing through this region. Bahawalpur was of great significance in the trade and trade route network also because of its geographical position, connecting the Indus plains with the Punjab and Rajasthan and further south, with Gujarat. In fact, the region, at the end of the nineteenth century, used to enjoy commercial transactions with Karachi, Lahore, Bombay and Calcutta (Muhammad Din 1908:273). The chief centres of commerce were Bahawalpur, Ahmadpur east, Allahabad, Khanpur and Hasilpur, and part of the commerce used to go to Afghanistan and Turkestan.

This region, then, definitely acted as a conduit to the Rajputana copper belts. The major routes connecting the Indus plains and Rajasthan have been delineated in the Rajasthan district gazetteers (Agarwal 1978; Sehgal 1972a, 1972b—these are based on old British

records) and more recently by G.L. Devra (1980:36–45). The Bikaner area, whose copper resources had been almost exhausted by the twentieth century, in the period under study, was providing some copper, especially in the light of its general geographical orientation to the Cholistan tract. Bikaner is connected by two major routes to the Bahawalpur region and Multan. The first route passed from Multan to Bahawalpur—Anupgarh—Mahajan—Lunkaransar—Bikaner from where it went on to Jaipur. This was probably the axis through which Harappa was linked to Bikaner and the regions further south—there were ferry crossings at the Sutlej and the channel of the Ghaggar-Hakra from where Anupgarh was reached. The second route's orientation was from Multan through Pugal to Bikaner. That Pugal mediated traffic between the Ganeshwar-Jodhpura culture and Harappa is suggested by the discovery of some fragments of copper arrowheads along with some microliths there (cf. Agrawala and Kumar 1982:131).

R.C. Agrawala (1984:160–1), on the basis of the landsat imagery of former rivers in this region, suggested the possible route connecting Sikar and Jhunjhunu districts, the core areas of the Ganeshwar-Jodhpura culture, and the Indus civilization sites to the west:

> Ganeshwar, as a site is ideally situated on the source of one of the streams of the river Kantli which is further fed by other streams from Kanwat-Thei-Khandela, all located in the copper zone of the Shekhawati region. . .The river Kantli seems to have been a major river during the pre-Harappan period. Flowing east of Jhunjhunu town, it now dries up near Rajgarh in the Churu District, whereas, in the past, it joined the Drishadvati river somewhere between Nohar and Bhadra in the north, from where there was no difficulty in moving towards Kalibangan which is hardly 50 km. . . . The Kantli river is, at some places, 2 to 3 km in width and it must have made possible, movement from Ganeshwar to Kalibangan and other Indus centres of the west.

It is possible that a land route from Ganeshwar to Sothi-Bhadra via Neem-ka Thana, Khetri, Chirawa and Rajgarh was also in use in the Harappan period, as Agrawala suggests (Agrawala and Kumar 1982:129). From the Sothi-Bhadra region, the Ghaggar-Hakra tract was followed to go west.

Regions to the North of the Indus—Harappa

The lines of communication in the region, stretching from the Bari *doab* right up to the Hindukush and the Karakoram mountains can be visualized along several lines. Firstly, there were interconnections between the Bari *doab* and the Potwar plateau. Secondly, routes went across the Indus to the Derajat province, a core region for providing access along a number of directions. Among other texts, the *Narrative of Various Journeys in Baluchistan, Afghanistan and*

the Punjab of Masson published in 1842 evocatively describes the nature of traffic that traditionally passed through the Derajat and the symbiosis of its traditional agricultural economy with elements of the *kafila* traffic coming from different, often far-flung, areas there (Masson 1842:chapters III and IV). In the period under discussion, the Derajat seems to have mediated interaction between Baluchistan and Harappa, on the one hand, and the Bannu-Peshawar axis through which access was gained into Central Asia and Afghanistan, on the other hand. The latter line of movement has been throughly discussed in Chapter 4 (pp. 240 ff.).

With reference to the first route, economically, the wide availability in the Salt range and some intermediary hilly outliers such as the Chiniot, Kirana, and Dhak escarpments, of steatite, gypsum, jasper, limestone, slate, granite, basalt, marble, quartzite, sandstone, *abri*, copper, lead, gold, and haematite, is of primary significance. Both the protohistoric and pre-modern traditions of exploitation in a number of the above-mentioned raw materials emphasize their possible exploitation by Harappa. At the same time, the absence of settlements with a mature, urban Harappan phase in the Potwar plateau has to be considered. In this context, the implications of several late radio-carbon dates from the sites of Sarai Khola, Jhang and Hathial West in this region are suggestive of the survival of the early Harappan (ie., the Kot Dijian level) culture, which is contemporaneous with the urban Indus tradition.

The basic interaction must have been along two routes, both of which emanated from the Jhang district. The main direction from Harappa to Jhang where the Kirana and Chiniot escarpments were readily accessible may have followed the trunk route mentioned by the *Imperial Gazetteer of India* (1908:9) that used to be taken by traffic coming from Delhi across Pak Pattan, crossing the Ravi to go to Jhang. The Ravi, incidentally, as mentioned in the gazetteer (1908:9) used to be crossed by fourteen ferries. From the Jhang district, after crossing the Chenab, the Jhelum could have been followed to the Potwar plateau; incidentally the Jhelum was a navigable river and Punjab salt used to be exported to Multan by it. Whether it was mediating traffic between Harappa and the Salt range in this period is not certain since the intervening region has not revealed any Harappan sites; nevertheless, considering the ease of communication through this route between the two regions, it may have been in use in the protohistoric period. The second route may have followed the Indus into the Derajat region where Harappan Gumla stood. A section of the Gomal plain, where Musakhel flourished in the early Harappan period, is located only four miles south of the Salt range, and it is likely that this region provided an access between the Potwar region and Harappa. The presence of a

Harappan seal at Musakhel underlines this connection (F.R. Allchin 1984:52).

The Derajat district was significant in the pattern of routes also because of its raw material resources of crypto-crystalline semi-precious stones and ordinary stones, which were found as *in situ* occurrences and in the form of water-worn pebbles in the Gomal and Takhwar rivers. These resources, incidentally, were used in a broadly contemporary context in the region itself, most strikingly by Harappan Gumla. Additionally, the Derajat region provided access into north Baluchistan, where a Harappan presence is attested to, and which was also providing serpentine to Harappa.

From the upper Indus plains and the Potwar plateau, a feeder route possibly went to Kashmir which contained resources like jade, amazonite and gold. From Rawalpindi, which is close to historic Taxila, an area where late Kot Dijian sites have been found, the route must have gone through the Jhelum gorge to Murree, then to Kohala and Baramulla.

Sind—East Punjab

That these two regions were involved in a trade which included raw materials is evident from the presence of artefacts of shell at Banawali, Ropar, Kotla Nihang Khan and Dher Majra, and chert at Balu, Rakhigarhi, Mitathal and Banawali, both of which could have been from Sind. In fact, the presence of chert cores at Banawali and Ropar suggests that it was reaching the sites in a raw material form, where the artefacts were then locally manufactured. Also at Banawali, a large number of lapis lazuli beads have been reported—this much-prized stone, whether from Baluchistan or Badakshan was reaching east Punjab through Bahawalpur which, in fact, was the major line of communication connecting Sind to Punjab.

Eastern Punjab is a fairly large geographical bloc with sites like Ropar in the northern section situated about 200 kms away from centres like Banawali, and Siswal in the Hissar district in the central-southern region. Keeping in mind this orientation, one can reasonably suggest that from Bahawalpur there were two major routes, one oriented to the upper Sutlej region, and one route going through the Ghaggar-Drishadvati divide of central Punjab.

As far as the first route is concerned, from the Ganganagar-Hanumangarh region, the Bhatinda district was reached which, in its southern area adjoining the above-mentioned region of Rajasthan, has yielded a large number of Harappan sites (Joshi et al. 1984:513). Incidentally, in the pre-Harappan period, the broad delineation of this route had been worked out with eight pre-Harappan sites in the Hanumangarh area and eleven sites in the Bhatinda district. This region has been described by Joshi et al. in their work on

the distribution pattern of Harappan sites in India (1984:514–5) as an important economic pocket of the period with twenty-one sites being located in an area approximately 50km x 25km. A study of the settlement pattern of the Bhatinda district suggests an urban complex made up of three types of settlements ie., towns, villages and cities. Large urban centres such as Dalewala, Gumi Kalan, Bagliaen-Da-Theh, Lakhmirwala and Hasanpur were about 1500 x 1500m in area. From here, a route went up to Sangrur where Rohira is located, and then to Ludhiana district. Ropar, Dher Majra and Kotla Nihang Khan were fairly close to other important centres of the protohistoric complex of the upper Sutlej such as Sanghol and, in the light of the presence of shell and chert artefacts in a number of sites in the Ropar district, it no doubt also shared in this general pattern of interaction with Sind.

Banawali and Rakhigarhi in Hissar, Mitathal in Bhiwani and Balu in Jind were clearly interacting with the Harappan centres of Sind through a route whose orientation from the Hanumangarh area veered to Hissar, passed on to Jind and finally linked up to Rohtak from where the Meerut and Gurgaon districts, both of which have yielded a few Harappan sites, were accessible. This route which was subsequently known as the Delhi-Multan road has been described at some length by M.L. Darling (1934), who travelled along this old road. From Sirsa where in '1398 Tamurlane passed this way on his devastating march to Delhi, and it is still said that the large mounds outside Sirsa owe their origin to the skulls of those his army slew', the road went to Hissar, then to Hansi, and Rohtak. At Maham in Rohtak this route was left and Darling continued to Jhajjar—Zahidpur—Kutani—Farukhanagar—Gurgaon. Interestingly, a number of Harappan sites have been found in Hissar and two Harappan sites, Baliana and Lohat, in Rohtak (Joshi et al. 1984:521–2).

As regards interaction in the Indo-Gangetic divide itself, in comparison to the pre-Harappan period, there was a very clear linking up with Ropar, Chandigarh, Ambala, Karnal, Sonipat and Meerut. All these areas yielded sites with Harappan levels (Joshi et al 1984: 521ff.).

East Punjab—Rajasthan

We have already noted the importance of Rajasthan as a source area for east Punjab providing it with copper, silver, a number of semi-precious stones and definitely one precious stone ie., emerald. We have also discussed the presence of a protohistoric complex in Rajasthan, the Ganeshwar-Jodhpura culture, which had definite Harappan links. The land and riverine routes linking these two regions have also been noted. Even sites as far as the Ropar district,

Dher Majra being a good example, were procuring raw materials from Rajasthan, and these reached them probably through the Hissar—Bhatinda—Sangrur—Ludhiana axis.

Sind—Gujarat

Contrary to earlier views on the subject, Gujarat was in no significant sense dependent on Sind for any of it basic raw materials. Whether it was chert/flint, sandstone, copper, semi-precious stones etc. they were extensively available within the region itself which, in fact, by the Harappan period had opened up significantly. At the same time, it is difficult to deny that there was Harappan migration to Sind (especially in the light of the absence of any significant antecedent protohistoric cultures there) and that Sind and Gujarat came to be linked administratively in an undefined but important way as the presence of Harappan seals at a number of sites in Gujarat would testify to; apart from Lothal, Surkotada and Rangpur, Harappan seals have been found at Pabumath, Dholavira, Gadhwalivadi, Kanewal, and Desalpar among others. In the light of this evidence, the issue of the routes of interaction between Sind and Gujarat needs to be discussed.

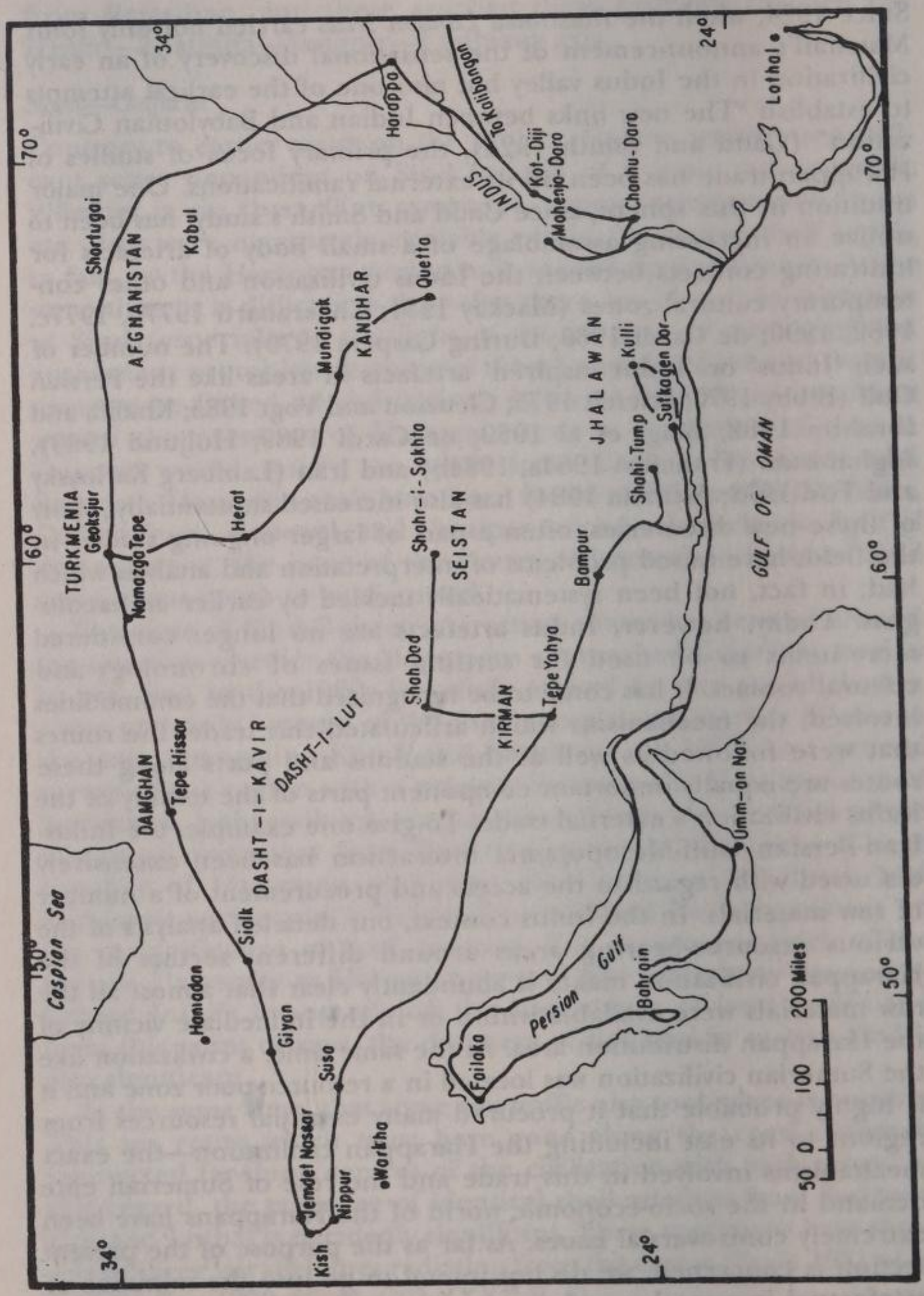
The issue of Sind-Gujarat interaction routes has centred around the question whether the Harappans approached Gujarat by land or by sea. Rao in the 1960s forcefully argued for the use of the sea route primarily because of the then conspicuous absence of sites in the area connecting Kutch and Kathiawar. In 1972, in a general survey of the region with a primary focus on the Harappan site of Surkotada, Joshi took up, among other things, the question of the nature of movement from Sind to Gujarat. In this survey a large number of Harappan sites were discovered in the Kutch and Kathiawar region which definitely invalidated Rao's hypothesis on the insignificance of land contacts. The subsequent work of the Baroda University at Harappan centres like Nageshwar has consolidated Joshi's hypothesis on the importance of land routes and from this point of view, the discovery of Kot Kori in eastern Sind is also significant.

At the same time, that some sea traffic also took place is possible. This sea route which must have gone along the coast definitely connected far-flung centres of the civilization with each other. In this regard, the presence of identical shell artefacts from Sutkagen Dor and Lothal is decidedly significant. These specimens have three sets of three parallel lines radiating from the centre (Stein 1931 pl vi, Su v.a i; Rao 1979–85: pl. CCLXXXII B, 5).

EXTERNAL TRADE ROUTES

Since 1924, when the *Illustrated London News* carried not only John Marshall's announcement of the sensational discovery of an early civilization in the Indus valley but also one of the earliest attempts to establish "The new links between Indian and Babylonian Civilization" (Gadd and Smith 1924), the primary focus of studies of Harappan trade has been on its external ramifications. One major tradition in this sphere, since Gadd and Smith's study, has been to utilize an increasing assemblage of a small body of artefacts for indicating contacts between the Indus civilization and other contemporary cultural zones (Mackay 1931; Chakrabarti 1977b, 1977c, 1982, 1990; de Cardi 1968; During Caspers 1970). The number of such 'Indus' or 'Indus inspired' artefacts in areas like the Persian Gulf (Bibby 1970; Friefelt 1975; Cleuziou and Vogt 1985; Khalifa and Ibrahim 1982; Biagi et al 1989; de Cardi 1989; Holjund 1989), Afghanistan (Francfort 1984a, 1984b) and Iran (Lamberg Karlovsky and Tosi 1973; Asthana 1984) has also increased substantially. Many of these new discoveries, often a part of larger ongoing studies in the field, have raised problems of interpretation and analysis which had, in fact, not been systematically tackled by earlier archaeologists. Today, however, Indus artefacts are no longer considered mere items to be used for settling issues of chronology and cultural contact. It has come to be recognized that the commodities involved, the mechanisms which articulated this trade, the routes that were followed as well as the stations and ports along these routes are equally important component parts of the totality of the Indus civilization's external trade. To give one example, the Indus-Iran-Persian Gulf-Mesopotamia interaction has been extensively discussed with regard to the access and procurement of a number of raw materials. In the Indus context, our detailed analysis of the various resource-bearing areas around different sectors of the Harappan civilization makes it abundantly clear that almost all the raw materials were available within or in the immediate vicinity of the Harappan distribution area. At the same time, a civilization like the Sumerian civilization was located in a resource-poor zone and it is highly probable that it procured many essential resources from regions to its east including the Harappan civilization—the exact mechanisms involved in this trade and the role of Sumerian elite demand in the socio-economic world of the Harappans have been extremely controversial issues. As far as the purpose of the present section is concerned, we do not intend to go into the minutiae of artefactual inventories and commodities involved, relying for the basic information in this regard on the comprehensive surveys and analysis which are available in at least two recent works

Map 12


70°
34°
24°
60°
50°
Shortugoi
AFGHANISTAN
Kabul
Harappa
To Kalibangan
INDUS
Kot-Diji
Mohenjo-Daro
Chanhu-Daro
Lothal
Quetta
KANDHAR
Mundigak
TURKMENIA
Geoksjur
Namazga Tepe
Herat
DAMGHAN
Tepe Hissar
DASHT-I-KAVIR
DASHT-I-LUT
Shahr-i-Sokhta
SEISTAN
Shah Ded
KIRMAN
Tepe Yahya
Bampur
JHALAWAN
Kulli
Shahi-Tump
Sutkagen Dor
Umm-an Nar
GULF OF OMAN
Persian Gulf
Bahrain
Failaka
Hamadan
Giyan
Siolk
Jemdet Nasar
Nippur
Suso
Kish
Warka
50 0 100 200 Miles

(Chakrabarti 1977b; Shaffer 1980). Our discussion will focus on the important departure from the pre-Harappan period and the linking up between the external and internal communication 'networks'.

As far as the important routes of contact are concerned, the existence of a north Afghanistan—north Iran—Turkmenia—Mesopotamian axis is clear from the presence of etched carnelian beads at a number of sites along this axis as well as the occurrence of Indus or Indus-type seals in many of them, among other artefacts. These sites include Shortugai (Francfort 1984a:303), Tepe Hissar (Chakrabarti 1977b:4), Shah Tepe (Chakrabarti 1977b:4), Kish (Chakrabarti 1977b:6–10). Furthermore, at Shortugai, *Turbinella Pyrum* shell bangles, Harappan ceramics and graffiti along with terracotta cakes and other objects have been reported; evidence of lapis exploitation has also been noted (Francfort 1984a:303). The route from Afghanistan followed a northerly direction through Bactria, which Francfort (1984b) has forcefully argued was in its western and eastern part urbanized, to Turkmenia, Nishapur (where the famous turquoise mines are located) and then to Tepe Hissar through the Meshed region, which is the border area of Turkmenistan. Tepe Hissar is located near Damghan. Going along the edge of the desert (Dasht-i-Kavir) Tehran was reached. The route to Mesopotamia following the main route, along the western fringes of the central desert, is topographically relatively easy going to Hamadan via Luristan whose administrative capital is Kermanshah.

The general direction of the southern overland route connecting the Harappan civilization and Mesopotamia has been specified by Chakrabarti (1977b:19): 'Tepe Yahya—Jalalabad—Kalleh Nisar—Susa—Ur line may be considered the southern overland route'. The evidence for interaction along this lines includes two potsherds with Harappan seal impressions and an etched carnelian bead at Tepe Yahya (Shaffer 1980:23), etched carnelian and long-barrel cylinder carnelian beads from Jalalabad (Chakrabarti 1977b:5), Indus-related material at Kalleh Nisar (Chakrabarti 1977b:4), an unspecified number of etched carnelian beads, one long-barrel cylinder carnelian bead and two Indus-inspired seals at Susa (Chakrabarti 1977b:4–5), several seals of Indus affiliation, a number of etched and long-barrel cylinder carnelian beads as well as seals at Ur (Chakrabarti 1977b:7ff). We may also mention that very limited objects of Mesopotamian and Iranian inspiration have been found in the Indus valley. Two lapis lazuli objects which may be from Mesopotamia have been pointed out by Chakrabarti (1977b:12): (i) a long, thin, glazed bead from Mohenjo-daro which is the only one of its type in the Indus valley but which was very common in Mesopotamia and (ii) an inlaid flower pendant from Harappa

which again is the only example of its kind here although in Mesopotamia the tradition of inlay has impressive antecedents. The other archaaeological evidence which is of definite external manufacture is the fragment of a steatite/chlorite vase with a mat motif from Mohenjo-daro; this belongs to the intercultural style of soft stone vessels which flourished in a widely spread-out network covering Iran, Mesopotamia and the Persian Gulf in the early Dynastic II–IIa period (cf. Kohl 1975), of which Tepe Yahya was an important centre.

As far as the route from Tepe Yahya to the Indus valley and Baluchistan is concerned, in the light of the insignificance of the Quetta-south Afghanistan interaction in this period, it is possible that there was an active trade route which radiated from the Las Bela region passing through both the Kej valley in the south and the Rakshan valley in the north to the Pasni-Jiwanri region where Sotka-Koh and Sutkagen Dor are located. This section of the route which is said to have been used for centuries by pilgrims and merchants travelling between India and the countries west of the head of the Persian Gulf was extremely difficult in its eastern part between Bela and Awaran but west of Awaran, once the Kej and Kolwa valleys were reached, the going was easy (Hughes-Buller 1907:343). Apart from Kulli sites in the Kolwa valley, there are a number of other protohistoric sites in the Kej, Panjgur, Rakshan and Dasht valleys which, in addition to Kulli ware, also sometimes contain Harappan artefacts. For instance, Stein (1931:44) noted that at Chiri Damb in the Panjgur valley 'among other relics left here by early occupation were a number of small stone beads, acquired by a local villager, some of which show decoration with a very ancient method of white inlay', obviously a reference to etched carnelian beads. These routes eventually converge at Bampur from where Tepe Yahya was accessible. From Tepe Yahya a branch undoubtedly went up to Shahr-i Sokhta and to Mundigak in Seistan. Shahr-i Sokhta has yielded a number of bangles made of the *Turbinella pyrum* shell which is available right up to the coast of Makran but not much further. It is interesting to note tht shell bangles have been found at the Harappan site in Sutkagen Dor. Balakot, in the Sonmiani bay of Baluchistan, as already mentioned was a major centre of bangle manufacture and these could have been carried along the Kej or Rakshan valleys to the Gwadar area and then inland as far as Shahr-i Sokhta. It is also interesting to note that etched carnelian beads have been found all through this route—at Chiri Damb in Makran (Stein 1931:44), at Tepe Yahya (Chakrabarti 1977b:5), and Mundigak (cf. Chakrabarti 1977b:3).

From Tepe Yahya a route also went to Shahdad where a large number of etched carnelian beads were identified, and which must

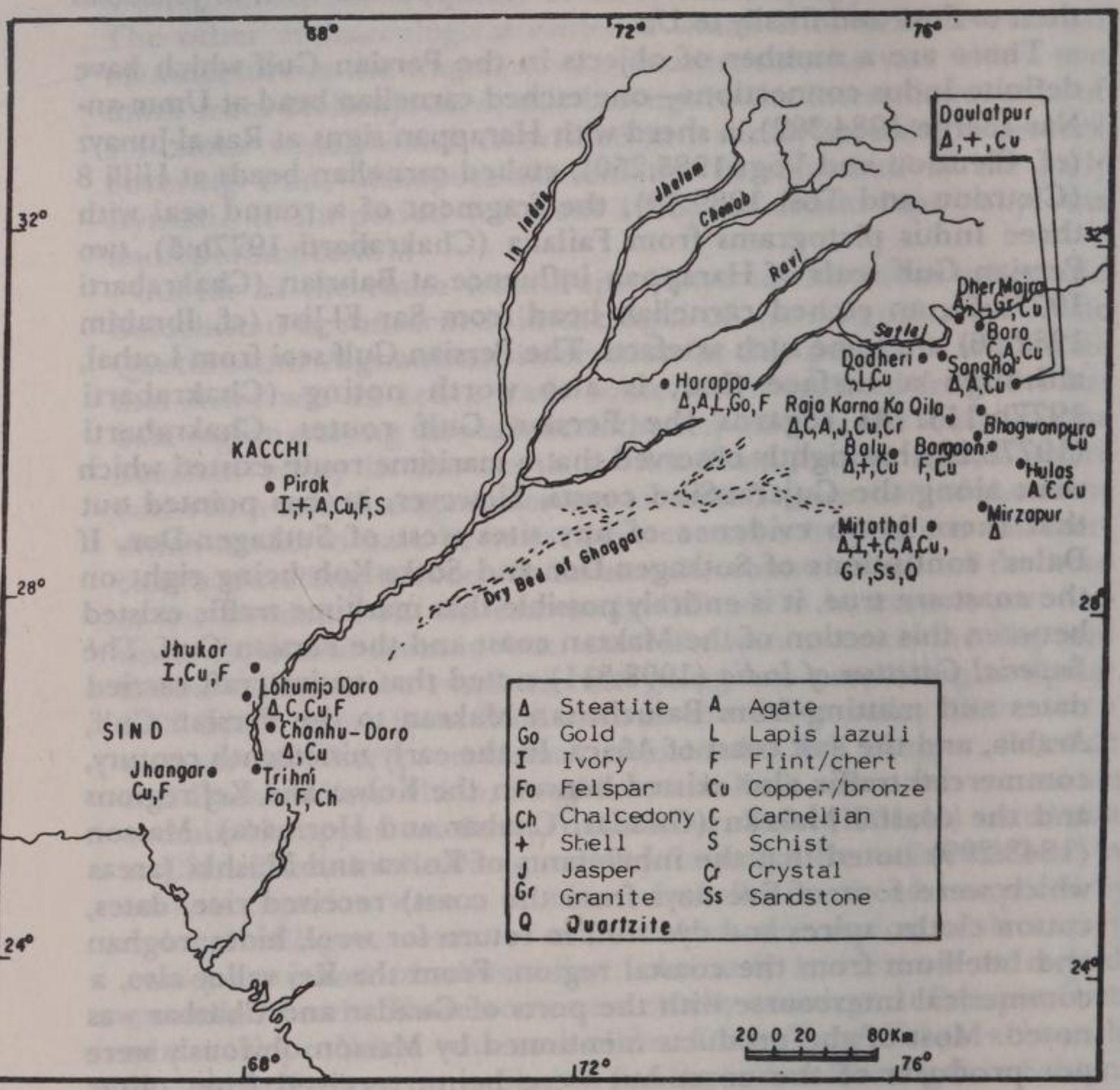
have articulated trade with north-central Iran. From Tepe Yahya the route through southern Iran to Mesopotamia went to Jalalabad then to Susa and finally to Ur.

There are a number of objects in the Persian Gulf which have definite Indus connections—one etched carnelian bead at Umm-an-Nar (Serge 1984:392), a sherd with Harappan signs at Ras al-Junayz (cf. Cleuziou and Vogt 1985:250), etched carnelian beads at Hilli 8 (Cleuziou and Tosi 1989:40), the fragment of a round seal with three Indus pictograms from Failaka (Chakrabarti 1977b:5), two Persian Gulf seals of Harappan influence at Bahrian (Chakrabarti 1977b:5), an etched carnelian bead from Sar El-Jisr (cf. Ibrahim 1982:36) are some such artefacts. The Persian Gulf seal from Lothal, although a surface find, is also worth noting (Chakrabarti 1977b:11). As regards the Persian Gulf routes, Chakrabarti (1977b:22) has rightly observed that a maritime route existed which went along the Gujarat-Sind coasts. However, he has pointed out that there is no evidence of any sites west of Sutkagen-Dor. If Dales' contintions of Sutkagen-Dor and Sotka-Koh being right on the coast are true, it is entirely possible that maritime traffic existed between this section of the Makran coast and the Persian Gulf. The *Imperial Gazetteer of India* (1908:311) noted that native craft carried dates and matting from Baluchistan Makran to the Persian Gulf, Arabia, and the east coast of Africa. In the early nineteenth century, commercial traffic also existed between the Kolwa and Kej regions and the coastal Makran (Gwadar, Chabar and Hormara). Masson (1843:289) noted that the inhabitants of Kolwa and Mushki (areas which were four of five days from the coast) received rice, dates, cotton cloths, spices and dye stuff in return for wool, hides, roghan and bdellium from the coastal region. From the Kej valley also, a commerical intercourse with the ports of Gwadar and Charbar was noted. Most of the products mentioned by Masson obviously were not products of the coast but were being received from other regions; that Balakot, Sutkagen-Dor and Sotka-Koh functioned in a similar way is probable.

THE LATE/POST HARAPPAN SITUATION

The term 'late Harappan' in the general archaeological literature on the subject, has a specific chronological and cultural connotation. Chronologically, it denotes the phase immediately following the mature urban phenomenon of the 3rd/2nd millennium BC. Culturally, it has come to be associated with a falling out or devolution of the Harappan civilization, its assemblages bearing a 'stylistic debt to the civilization, so deep as to indicate cultural unity' (Possehl 1980:13) which include the presence of writing, certain similarities

Map 13



SITEWISE DISTRIBUTION OF RAW MATERIALS IN SIND, KACCHI AND PUNJAB – LATE/POST HARAPPAN PERIOD

in the shapes and forms of beads and painted designs, but at the same time lacking the kind of cohesiveness, uniformity and the sheer scale which marked the mature Indus phenomenon. It may be mentioned that this conventional understanding of the post-urban phase in the Harappan distribution area is extremely simplified. On a theoretical level, the nature of growth and progress in this period has been critically analysed recently by Chakrabarti (n.d.). The developments that were witnessed in this period has been underlined by a number of recent field researches as well. In Gujarat, the association of late Harappan settlements with a subsistence pattern based primarily on millet which led to a large-scale use of the black cotton soil of the region has been argued forcefully by Possehl (1980:9; also see Rissman 1985:353). The second millennium site of Pirak, in Baluchistan, has also revealed spectacular evidence of multicropping even of summer crops like rice, millet and sorghum (grown, in the opinion of the excavators, with the introduction of a permanent irrigation system), the use of seals and an impressive metallurgy (Jarrige 1985b). In this section, we propose to see the extent to which the late-Harappan situation as one of growing regionalism is reflected in the protohistoric communication axis and the nature of new developments, if any, that were taking place.

Sind

The nature of resource usage in this area is clear from a reading of Chart 16.

The Evidence of Manufacture of Finished Products at Different Sites

Chert: Flakes and cores in chert have been found at Jhukar, Lohumjo-daro Jhangar and Trihni (see notes to Chart 16, p. 144).

Baluchistan

The raw materials used at Pirak are evident from a reading of Chart 16.

The Evidence of Manufacture of Finished Products at Different Sites

Ivory: The evidence of local working of ivory is in the form of (i) the large fragment of an ivory tusk; (ii) the evidence at the site of all stages of manufacture of projectiles in specialized workshop areas (Jarrige 1985b:54).

Chart 16

SIND, CENTRAL INDUS PLAINS AND BALUCHISTAN—
LATE HARAPPAN PERIOD

Raw Material	*Harappa*	*Jhukar*	*Jhangar*	*Chanhu Daro*	*Trihni*	*Lohumjo Daro*	*Pirak*
Steatite	nose discs, beads, seals, pendants			seal, amulets		beads	
Ivory		pin					fragment of tusk, combs, projectiles
Shell							bangles
Carnelian						bead fragment	
Agate	bead						bead
Lapis Lazuli	inlay						
Copper/ Bronze		spear-head	awl & chisel frag-ments	pins, amulet, socketed axe, chisel		knife-blade	axes, dag-gers, arro-heads, disks, conical points, knife frag-ments, seals, spear-head
Gold	bead						
Semi-Precious Stone					Felspar bead. Chalcedony flakes		
Ordinary Stone	Chert weight	Chert polisher, pounder, flakes, core	Chert flakes		Chert cores & flakes	Chert flakes	Flint blades, triangles, lunates, points. Schist arrow-heads

Copper/Bronze: Crucibles similar in form to those used at Mehrgarh in the 4th and 3rd millennium BC have been found (Jarrige 1985b:52).

Ghaggar/Hakra System

Although details are not available, that specialized activities were being carried out at the late Harappan Cemetery H related complex here is evident from the statistics supplied by Mughal (1982:93); 18% of the sites were 'exclusively industrial sites' and 28% were 'settlement sites with kilns or specialized activity'.

Punjab

The raw materials—minerals, metals—in this region are evident from a reading of Chart 17.

The Evidence of Manufacture of Finished Products at Different Sites

The only site with evidence of specialized activity in non-local raw materials is Dher Majra (Prufer 1951). Here bead-making continued to be undertaken, albeit on an even more extensive scale than before. The beads were manufactured out of agate, lapis lazuli, crystal, steatite, jade, ivory and shell (cf. Shaffer 1981:81).

Gujarat

The diverse natural resources utilized by the sites in Gujarat are evident from a reading of Charts 18 a and b.

The Evidence of Manufacture of Finished Products at Different Sites

Beads: An incompletely perforated agate bead has been found at Lothal (Rao 1979-85:pl. CCLXX, No. 7).

Copper/Bronze: In Phase Va at Lothal the four brick skirted pavements interconnected by shabbily constructed drains having a common outlet have been interpreted by Rao (1979-85:98-9) as being a part of a smith's workshop: 'a large smith was established here to enable several copper smiths to work under one roof and perhaps under the guidance of a merchant manager.' This is confirmed by the discovery of terracotta crucibles and copper objects near it.

Shell: Beyt, Okhamandal *taluka*, Jamanagar district, (Bhan 1986:20), Bolera, Panchasar (both in Mehsana district) and Ervada (Surendranagar district) have provided evidence of shell working (Hegde & Sonawane 1986:30-2). Significant quantities of shell artefacts and their manufacturing waste have been found at Beyt. Here, three classes of mollusca ie., *Lamelli-branchia, Scapophoda* and

Chart 17

INDO-GANGETIC DIVIDE—LATE HARAPPAN PERIOD

Raw Material	*Daulatpur*	*Dadheri*	*Bhagwan-pura*	*Raja-Karna-Ka-Qila*	*Sanghol*	*Mirzapur*	*Bargaon*	*Hulas*	*Balu*	*Bara*	*Mitathal*	*Dher Majra*
Steatite	beads			beads	beads	beads			beads	beads		
Ivory										pin		
Shell	bangles								bangles	bangle fragm-ents		
Carnelian		beads		beads				beads	beads	beads		
Agate				beads	beads, inlays			beads	beads	beads	beads	
Jasper				beads								
Lapis Lazuli		beads									beads	
Copper/ Bronze	bangles, fish	chisels, hooks	rods	spearhead	chisels		rings	bangles, objects, chisels, rings, wires		beads, fishook,	bangles, objects celt. Indeterminate objects, rings	
Ordinary Stone				Crystal beads			Chert blades			Granite weight. Sandstone weights, querns, pestles. Quartzite hammer		Granite balls
Jade												beads

unspecified gastropods were worked for making bangles, rings, ladles, gamesmen, beads and seals (Rao 1987:56). A number of rejected columella of conch shell were also recovered. In the Mehsana and Surendranagar districts sites also, the presence of manufacturing waste including *Turbinella pyrum* columella and apex portions, beads of chank and chank bangle fragments suggest the presence of local shell industries (Hegde & Sonawane 1986:28).

Ordinary Stone: A large number of lithic factory sites in Gujarat have been noted. Chalcedony cores and waste fragments have been found at Bhojavadar III, Bhojavadar IV, Itaria, Kerlavlo, Khanderio I, Lakhanka, Rampara I (Possehl 1980:Appendix D) in the Ghelo and Kalubhar vballeys. In Jamnagar, lithic factory sites have been noted at Bhangor I, Rupamora, Tarana III, Arikihan I (Bhan 1986:16). At Bolera a blade industry, including chert cores, has been noted (Hegde and Sonawane 1986:30). Kanewal, in Kheda district has also yielded a number of cores in chalcedony, quartz, banded agate, and chert (Mehta et al. 1980:55-7) from, which undoubtedly the microliths at the site were manufactured.

Raw Material Procurement

A careful reading of the relevant charts makes it abundantly clear that in most of the regions, no significant raw materials were being procured over great distances for manufacturing artefacts. In the Indus plains, the pendant with lapis lazuli inlay at Harappa is the only exception. However, since it is found in the context of a burial (Cemetery H) it is entirely possible that it is an heirloom. In Gujarat, not a single category of artefacts required its raw material from outside the region. Eastern Punjab and the Gangetic Plains, however, are lacking in most natural resources and the archaeological inventories of several sites there testify to non-local resources being exploited. Agate, jasper, carnelian, steatite as well as, in all probability, copper were being procured from Rajasthan. The presence of shell bangles at Daulatpur, Balu and Mitathal and lapis lazuli at Dadheri and Dher Majra also suggest a communication axis that included Sind and Afghanistan.

Trade Routes

The post-Harappan period, in relation to the rich archaeological inventories of the mature urban sites, was admittedly a far poorer cultural horizon. In no region do we find the scale and diversity which marked the mature Harappan phenomenon's archaeological repertoire. Admittedly there were significant continuities—Dher Majra, near Ropar, continued, at a more extensive scale than before, as a significant bead manufacturing centre, and Beyt

Chart 18 a

GUJARAT AND MAHARASHTRA—LATE HARAPPAN PERIOD

Raw Material	*Daimabad*	*Varsus*	*Kanewal*	*Lothal*	*Rangpur*	*Rampura I*	*Ratanpura*	*Rojdi*	*Mehgam*	*Somnath*	*Akru*
Steatite				beads, bangles, ring, ear ornament, seals	beads		beads	beads		beads	
Ivory	pendant, bead			awls	beads						
Shell	pendants, beads, bangles	bangle fragments	beads	beads, rings, inlays, ladles	beads, bangles		beads	beads		beads	
Carnelian & Bloods-Stone	tools, bead		beads, microliths	beads. Bloodstone bead	beads		beads	beads	bead	bead	
Agate			beads, microliths	beads, blade	beads					bead, microliths	scrapers
Jasper	tools		microliths	blades, lunates, beads	beads			tools			scrapers
Copper/ Bronze	celt fragment, lump, slag, animal figurines, chariot		strips, bangle	axe, blade beads, awls, nail, hook, bangle, ring,animal figurine	celts, knives, pins, needles, pieces		bangles, hook, wire pieces, pin, knife		celt		

(*Chart 18 a Contd*)

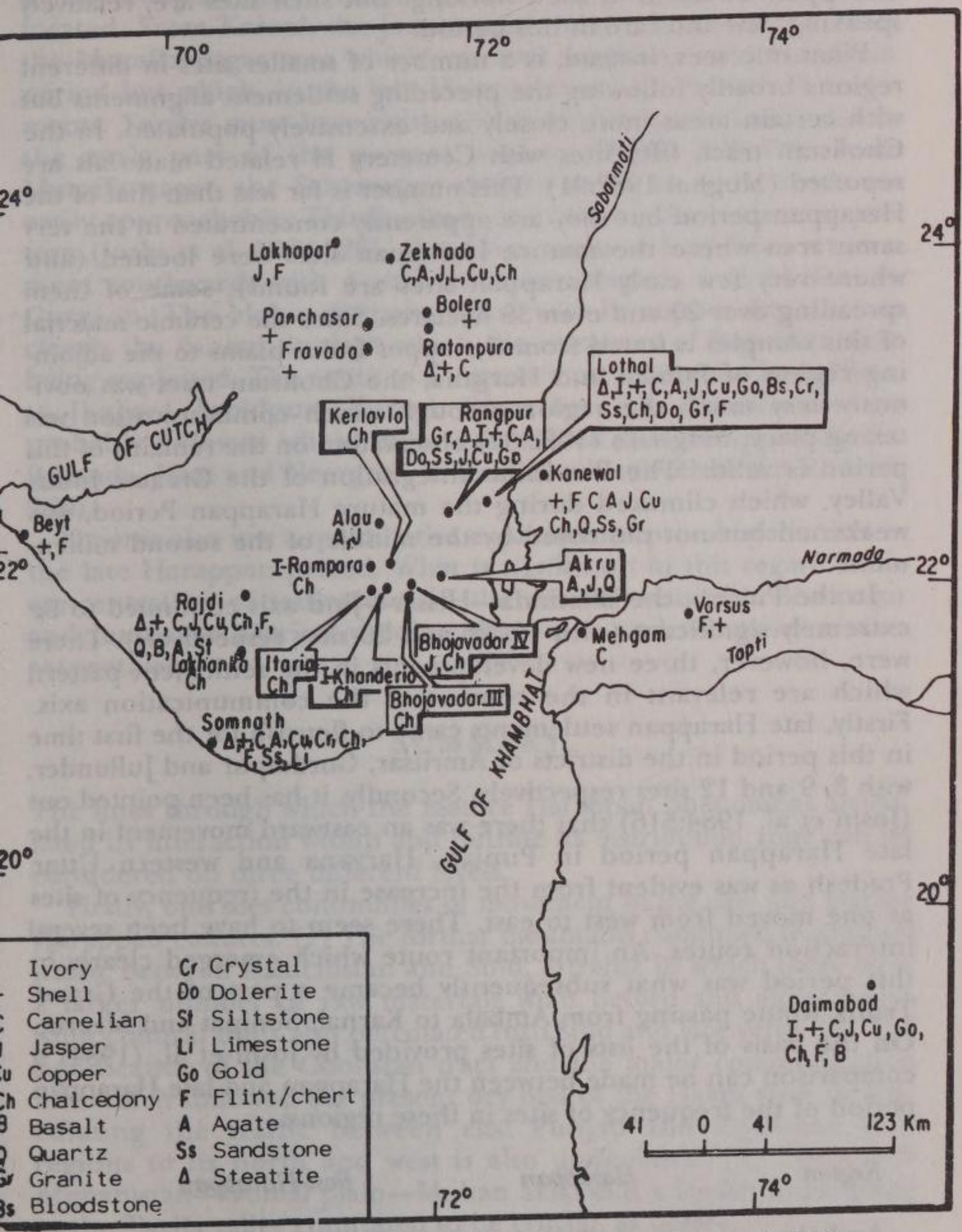
Raw Material	*Daimabad*	*Varsus*	*Kanewal*	*Lothal*	*Rangpur*	*Rampura I*	*Ratanpura*	*Rojdi*	*Mehgam*	*Somnath*	*Akru*
Gold	beads			beads, foils, beads pieces							
Ordinary Stone & Chalcedony	Chalcedony industry. Chert blades, beads. Basalt tool, hammer, bull	Chert blades	Chert microliths, beads. Chalcedony microliths. Quartz cones. Sandstone querns, muller. Granite muller	Crystal beads, Sandstone weights, tripod, muller, rotary mill. Chalcedony blades, lunates. Dolerite weights. Granite pounders, ball, beads. Chert blades, flakes	Sandstone mullers, Dolerite weight. Granite weight. Aplitic weight	Chalcedony cores, blades, flakes, waste fragment		Chalcedony, Chert, Quartzite, basalt tools		Crystal beads, Chalcedony microliths. Chert scrapers. Sandstone muller. Limestone ball	Milky quartz scrapers

Chart 18 b

GUJARAT AND MAHARASHTRA—LATE HARAPPAN PERIOD

Raw Material	*Bhojavadar III*	*Bhojavadar IV*	*Khanderio I*	*Itaria*	*Ervada*	*Kerlavlo*	*Lakhanka*	*Beyt Dwarka*	*Panchasar*	*Bolera*	*Alau*	*Zekhada*	*Lakhapar*
Shell					artefacts			artefacts	artefacts	artefacts			
Carnelian												beads	
Agate											scrapers	beads	
Jasper		flake									scrapers	beads, microliths	cores, flake
Lapis Lazuli												beads	
Copper/ Bronze												bangles, awls, wires	
Ordinary Stone & Chalcedony	Chalcedony blades & cores	Chalcedony cores	Chalcedony cores, blades	Chalcedony cores, blades	Chalcedony cores, blades, waste fragments	Chalcedony blades, flakes, cores, waste fragments		Chert flakes			Chalcedony cores, flakes		Chert blades

Map 14



SITEWISE DISTRIBUTION OF RAW MATERIALS IN GUJARAT AND MAHARASHTRA – LATE/POST HARAPPAN PERIOD

Dwarka marked the continuance in the Jamnagar region of the Harappan tradition of shell working. But such sites are, relatively speaking, few and rare in this period.

What one sees, instead, is a number of smaller sites in different regions broadly following the preceding settlement alignments but with certain areas more closely and extensively populated. In the Cholistan tract, fifty sites with Cemetery H related materials are reported (Mughal 1982:91). This number is far less than that of the Harappan period but they are apparently concentrated in the very same area where the mature Harappan sites were located (and where very few early Harappan sites are found), some of them spreading over 20 and even 38 hectares. Since the ceramic material of this complex is found from the upper Indus plains to the adjoining region of Punjab and Haryana, the Cholistan tract was obviously very much the region through which communication was taking place. Mughal's (1982:92) observation on the remains of this period is valid: 'The Pan-Indus integration of the Greater Indus Valley, which climaxed during the mature Harappan Period, was weakened but not destroyed by the middle of the second millennium'.

In the Punjab, the Bhatinda—Hissar—Jind axis continued to be extremely significant (with 10, 96 and 26 sites respectively). There were, however, three new developments in the settlement pattern which are relevant in the context of the communication axis. Firstly, late Harappan settlements came to flourish for the first time in this period in the districts of Amritsar, Gurdaspur and Jullunder, with 3, 9 and 12 sites respectively. Secondly, it has been pointed out (Joshi et al. 1984:516) that there was an eastward movement in the late Harappan period in Punjab, Haryana and western Uttar Pradesh as was evident from the increase in the frequency of sites as one moved from west to east. There seem to have been several interaction routes. An important route which emerged clearly in this period was what subsequently became a part of the Grand Trunk Route passing from Ambala to Karnal, Sonipat and Meerut. On the basis of the lists of sites provided by Joshi et al. (1984) a comparison can be made between the Harappan and late Harappan period of the frequency of sites in these regions:

Region	*Harappan*	*Post-Harappan*
Ambala	1	21
Karnal	1	53
Sonipat	2	11
Meerut	2	8

From the Ambala and Karnal region a route undoubtedly went to Saharanpur where as many as 99 late Harappan sites were located. From Karnal, the Jamuna river could be crossed to enter the Muzaffarnagar area which was *terra incognita* in the Harappan period but which, in the late Harappan period, yielded 14 settlements. Ferries must have existed then as they undoubtedly did in the early part of the present century (Nevil 1920:70). From Muzaffarnagar, the Saharanpur district which lay to its north was easily approachable. Thirdly, from the data on the settlement pattern (Joshi et al. 1984:526), there also seems to have been a movement southwards with 4 sites in Mahendragarh, and 14 sites in Gurgaon. The Mahendragarh region with its copper deposits was clearly the funnel through which the resources of Rajasthan were being exploited. The route to Gurgaon must have gone from Hissar to Jhajjar—Zahidpur—Kutani. From here the Sahibi river was probably followed whose valley has yielded late Harappan sites at Basonda, Jasat and Neorgarh in the Pataudi sub-tehsil (I.A.R. 1978-9:26).

Gujarat also saw a quantitative expansion of protohistoric sites in the late Harappan period. What is significant in this regard is the concentration of settlements in the coastal areas with Bhavnagar and Jamnagar districts yielding thirty-nine and twenty-seven sites respectively.

SUMMARY

The lines through which the mature Harappan phenomena articulated its interaction within and outside its distribution zone can be considered on three different levels.

Firstly, one sees continuities of movement in the pre- and mature Harappan cultures. (1) The Kirthar mountains continued to mediate traffic between Baluchistan and Sind, a traffic in which there were a larger number of raw materials than before and along which Kulli cultural traits also percolated into Sind and vice versa. (2) The significance of the Cholistan tract and the major communication line which followed the present dry bed of the Hakra river in articulating the traffic between east Punjab and Rajasthan with regions to its north and west is also undeniable. (3) The north Afghanistan—Gomal plain—Multan axis, with a feeder route going to the Taxila valley continued to be crucial, as before.

Secondly, there were other lines of communication, many of which were amplified and sustained by the efflorescence of the first Indian urbanization. Our survey has established the existence of an important communication nexus connecting sections of Sind on the one hand, and Sind and the central Indus plains on the other.

(1) Emanating from the Karachi region, one line of movement went through Kohistan and, following broadly the western banks of the Indus river, reached the Larkana district where Mohenjo-daro was located. From Larkana, the Indus was crossed to reach Chanhu-daro and the eastern segment of Sind. (2) There was also a route which passed from the Sukkur/Rohri hills to Harappa on the one hand and the Ghaggar/Hakra stretch on the other. (3) That the Indus river was also used for some amount of traffic is a distinct possibility, although this was not the sole route in the Sind region.

Sind and Baluchistan seem to have been interacting both over land and along the coast with Gujarat. (1) The eastern segment of Sind, although sparsely settled in the Indus phase, mediated a route between the Sind plains and Gujarat through Kutch and Kathiawar. (2) A sea route, hugging the coast linking the esternmost outpost of the Harappan civilization ie., Sutkagen dor and Lothal in Gujarat, also appeared and was flourishing.

Land and riverine routes connected the Bahawalpur and central Indus region with Rajasthan. (1) One land route went from the Multan-Montgomery region to Bahawalpur, from where the Anupgarh-Lunkaranser-Bikaner—Jhunjhunu axis was traversed. (2) An important link was the Multan—Pugal—Bikaner route. (3) There was also a land route from Ganeshwar to Sothi-Bhadra via Neem-Ka-Thana and Khetri, (4) That the Kantli river was mediating traffic between Rajasthan and the regions to its north and west as well is likely. This river flowing from the Sikar-Jhunjhunu region reached the Ghaggar-Hakra depression at a point between Nohar and Bhadra where it joined the Drishadvati, and from where Kalibangan and other sites to the west were reached. Between Sind and east Punjab, there were two major routes that passed through the Bahawalpur region. From there, (1) one branched off to the Upper Sutlej region, going through the Bhatinda and Ludhiana districts till the edge of the Himalayas where Manda was located. (2) The other, after passing the Ghaggar-Drishadvati divide of central Punjab, went to Hissar and Jind, reaching Rohtak from where one branch crossed the Yamuna to Meerut and the other proceeded to Gurgaon.

East Punjab also shared a very close interaction with Rajasthan, which was articulated by riverine and land routes. (1) A branch of the Kantli river, which is now extinct, acted as a channel between the Sikar district and Hissar. (2) Another river, the Dohan, which originated to the north of Baleshwar also went to Haryana. (3) The land route went from Ganeshwar through Rajgarh from where one branch went to Bhiwani where Mitathal was located, and the other reached the Sothi-Bhadra region.

Finally, some of the crucial early Harappan connections became relatively defunct in the Harappan phase. The north/ central Baluchistan—Sind route lapsed into comparative obscurity with no Harappan settlements in either the Quetta-Pishin valleys or in the Surab valley and the Kalat plateau.

It appears that there were modifications in some of the above-mentioned routes during the late/post Harappan period. (1) An archaeological gloom settled over the Sind—central Indus routes, and the Gomal—central Indus line of movement. The Cholistan tract also, although not denuded of cultural pockets, ceased to buzz with the movement of trade and other cultural items. (2) The focus of the communication network shifted clearly to the Indo-Gangetic divide right into the heartland of the Yamuna/Ganges doab where new routes were being traversed and old ones consolidated. The major development of the 2nd millennium BC was the development of a route which presaged the Grand Trunk route following the Chandigarh-Ambala-Karnal-Panipat-Meerut line. The Hissar-Jind-Rohtak axis also remained significant with an important feeder route going through Gurgaon into Pataudi. Through Haryana, important routes went to Saharanpur and Muzzafarnagar. (3) The other important development in the late/post Harappan period was the increasing importance of the coastal route in Gujarat where a number of settlements came to be concentrated.

With regard to the external trade of the Harappan civilization, the distribution of different Indus and Indus related artefacts suggests a deepening of the extant links with Afghanistan and Iran. What was new and possibly of great import was, however, the creation and formalization of interaction with Mesopotamia and the Persian Gulf.

NOTES TO CHARTS

8. *Mohenjo-daro*: Marshall 1931:relevant chapters; Mackay 1938: relevant chapters; Pracchia, Tosi and Vidale 1985:207–47; Kenoyer 1985:297–344. *Chanhu-daro*: Mackay 1943:relevant chapters. *Kot Diji*:Khan 1965:21. *Kot Kori*: Khan 1981:43–6. *Jhukar*: Majumdar 1934:10–18. *Lohumjo-daro*: Majumdar 1934:51–8. *Lakhiyo*: Majumdar 1934:68. *Ali Murad*: Majumdar 1934: 90–91. *Damb Buthi*: Majumdar 1934:120. *Shahjo-Kotiro*: Majumdar 1934:137–9. *Karchat*: Majumdar 1934:131. *Gharo Bhiro*: Mughal 1972d:134. *Dhal*: Majumdar 1934:126. *Thano Bula Khan*: Majumdar 1934:142. *Naru Waro Dharo*: *PA* 1964:44. *Goth Hasan Ali*: *PA* 1968:2. *Tharro on Gujo*:*PA* 1964:9–10. *Amri*: Majumdar 1934: 24ff. *Allahdino*:*PA* 1964:9, Shaffer 1979:17–29; Fairservis 1982:107–12. *Judeiro-jo-daro*:*PA* 1964:12.
9. *Harappa*: Vats 1940: relevant chapters. *Chak Purbane Syal*: Vats 1940: 475–6.
10. *Gumla*: Dani 1970–1:47, 48, 86–8. *Rehman Dheri*: Khan 1979:375–403. *Karam Shah*: Dani 1970–1:23. *Bud Ki Dheri*: Dani 1970–1:32. *Hathala*: Dani 1970–1:88–102.

11. *Kalibangan*: Lal 1979:89–96. Agrawala and Kumar 1982:127; *I.A.R.* 1960–1:31–2, 1962–3:30, 1964–5:38–9. *Khanpuri Ther*: Dalal 1980:12. *Dewaliana*: Dalal 1980:12. *Shikhri Ther*: Dalal 1980:12ff. *Siddhuwala Ther*: Mughal 1984:92. *Takkhanwala Ther*: Dalal 1980:3. *Derawar*: Dalal 1980:12. *Kudwala Ther*: Dalal 1980:19. *Sandhanwala Ther*: Dalal 1980:19. *Parharewala Ther*: Dalal 1980:12.
12. *Banawali*: Bisht and Asthana 1979:229–30; Bisht 1982:119; *I.A.R.* 1983–4:24–8. *Rohira*: Sharma and Kumar 1980–1:127; *I.A.R.* 1982–3:65–6. *Ropar*: Sharma 1982:154–61; Datta 1984:18–27. *Kotla Nihang Khan*: Sharma 1982:141. *Mitathal*: Bhan 1975:17, 59, 62, 70, 79. *Rakhigarhi*: Bhan 1975:101. *Siswal*: Shaffer 1981:70. *Chandigarh*: Lalman 1971:370; Sharma 1982:158; Shaffer 1981:74. *Dher Majra*: Prufer 1952:9–26. Shaffer 1981. 80. *Balu*: *I.A.R.* 1978–9:69; 1983–4:29.
13. *Lothal*: Rao 1979–85: relevant chapters. *Rangpur*: Rao 1962 and 1963:142–52. *Surkotada*: Joshi 1972:129–35. *Somnath*: Nanavati et al. 1971: 17–77; *I.A.R.*: 1955–6:78. *Kharika Khanda*: Joshi 1962:68. *Pirwada Khelar*: Joshi 1972:113. *Nagwada*: Hegde et al. 1988:60ff. *Nageshwar*: Bhan and Kenoyer 1980–1:115–20. *Bhagatrav*: Rao 1962 and 1963:190. *Vantavash*: *I.A.R.* 1979–80:100. *Kotada*: Joshi 1962:67. *Kotara*: Joshi 1962:67. *Desalpur*: *I.A.R.* 1963–4:10; Joshi 1972:105. *Kerasi*: Joshi 1962:65. *Pabumath*: Joshi 1962:65; *I.A.R.* 1978–9:67–8.
14. Raghunadan et al. 1981:57–61.
15. *Nausharo*: Jarrige 1974–86:78–114. *Balakot*: Dales 1979:252–68. Dales 1981:31. *Sutkagen Dor*: Stein 1931:63–8. *Periano Ghundai*: Fairservis 1959:330.
16. *Harappa*: Vats 1940:218–230. *Jhukar*: Majumdar 1934:15. *Jhangar*: Majumdar 1934:59–79. *Chanhu-daro*: Mackay 1943: 26, 140, 180–9, 291–2. *Trihni*: Majumdar 1934: 72. *Lohumjo-daro*: Majumdar 1934:58. *Pirak*: Jarrige and Enault 1973:105–14.
17. *Daulatpur*: *I.A.R.* 1976–7:19, 1977–8:23. *Dadheri*: 1976–7:43–4. *Bhagwanpura*: *I.A.R.* 1975–6:16–17. *Raja Karna ka Qila*: *I.A.R.* 1974–5:16. *Sanghol*: *I.A.R.* 1968–9:25, 1969–70:31–2. *Mirzapur*: *I.A.R.* 1975–6:18. *Bargaon*: *I.A.R.* 1963–4:56–7. *Hulas*: *I.A.R.* 1980–1:76, 1982–3:100–3. *Balu*: *I.A.R.* 1978–9:69. *Bara*: Sharma 1982:150. *Mitathal*: Bhan 1975:59–79. *Dher Majra*: Prufer 1952:9–26.
18. *Daimabad*: Sali 1986: relevant sections. *Varsus*: *I.A.R.* 1978–9:16. *Kanewal*: Mehta et al. 1980:19–69. *Lothal*: Rao 1979–85: relevant sections. *Rangpur*: Rao 1962 and 1963:143–52. *Rampara* I: Possehl 1980:232. *Ratanpura*: *I.A.R.* 1984–5:17. *Rojdi*: Possehl et al. 1985:91–4. *Mehgam*: Rao 1962 and 1963:189. *Somnath*: Nanavati et al. 1971:17–77. *Akru*: Rao 1962 and 1963:185. *Bhojavadar III*: Possehl 1980: 142–4. *Bhojavadar IV*: Possehl 1980:145–6. *Itaria*: Possehl 1980:172–4. *Kerlavlo*: Possehl 1980:189–91. *Khanderio I*: Possehl 1980:192–3. *Lakhanka*: Possehl 1980:202–4. *Beyt*: Rao 1987: relevant sections. *Bolera*: Hegde and Sonawane 1986:30. *Alau*: Rao 1962 and 1963: 185. *Panchasar*: Hegde and Sonawane 1986:31 *Eravada*: Hegde and Sonawane 1986:32. *Lakhapar*: Joshi 1962:66. *Zekhada*:*I.A.R.* 1976–7:14–15. 1977–8:20 21. *Khanderio I*: Possehl 1980:192–3.

4

Neolithic and Chalcolithic Cultures Outside the Harappan Orbit

The neolithic-chalcolithic cultures outside the spatial limits of the Harappan distribution zone occupy a culturally and geographically diverse space, stretching from the Chitral highlands to the Chingleput district of Tamil Nadu and across Shahi Tump at the edge of the Makran to the remote Naga hills in the north-east. We have delineated fifteen major sub-regions within this horizon: (1) The North-West Frontier highlands and lowlands, (2) Kashmir, (3) north-east Rajasthan, (4) south-east Rajasthan, (5) Malwa, (6) Maharashtra, (7) the Andhra Plateau and the Andhra coastal plains, (B) the north Karnataka plateau and the Malnad region, (9) south Karnataka, (10) Tamil Nadu, (11) the upper Gangetic plains, (12) the middle Gangetic plains, (13) the lower Gangetic plains and the Chhotanagpur plateau, (14) the Vindhyachal plateau, and (15) north-east India. What is common, however, is that these cultures broadly seem to mark the beginning of settled agricultural life in the various regions that they occupied. Partly contemporary with the first Indian urbanization ie., the Harappan civilization, some of them go back to the third millennium B.C., and continue at least till the beginning of the first millennium B.C. when iron technology became fairly widespread in the subcontinent.

In the context of the trade routes that evolved around these disparate and far-flung horizons, these will be outlined primarily on the basis of the pattern of resource usage and access along with the evidence on interregional cultural links enunciated in the artefactual repertoires of different sites. Additionally, the basic distribution of settlements along many important arteries of communication that cut across regions is an important source of information. The linkages between some of these cultural zones and the Harappan phenomenon, already suggested in the previous chapter, is also one of the themes that will be explored.

DATA ON INTERNAL INTERACTION

The North-West Frontier Highlands and Lowlands

This section of the North-West Frontier province consists, on the one hand, of a large mass of hills and valleys such as the Dir, Swat, Chitral, Ghorband and Buner, and on the other, of the Peshawar lowlands of about 2500 square miles which are hill-girdled except in the south-east. The Italian Archaeological Mission has attempted to work out the cultural sequence of this region from the neolithic till the beginning of the early historic period exploring and excavating a large number of sites (Stacul 1966a, 1966b, 1967a, 1967b, 1969a, 1969b, 1970a, 1970b, 1973, 1975, 1977, 1979a, 1979b, 1979c, 1980a, 1980b, 1981, 1984a, 1984b; Antonini and Stacul 1972; Stacul and Tusa 1975, 1977; Tusa 1979, 1981; Faccenna 1964–5; Antonini 1973). The Peshawar University (Dani 1967) found large protohistoric grave complexes (whose earliest period of occupation is contemporaneous with Period V in the general Swat sequence) in Timargarha, Balambat and the Thana area as a result of which this cultural complex has somewhat inexactly been described as the Gandhara Grave Culture. The subsequent work of the Peshawar University (Khan 1973) at Zarif Karuna, a graveyard site located at the north-west opening of the Peshawar valley, brought this culture almost to the valley itself. The identification of a red burnished pottery at Taxila bearing close similarity to that of Swat period VI by the joint Pakistan-British Potwar project (Allchin 1982b) means that this culture came to include the Potwar plateau as well.

The Sitewise Distribution of Raw Materials

The raw materials used, as Charts 19a–b show, include copper/bronze, gold, silver, alabaster, agate, carnelian, jade, lapis lazuli, onyx, chalcedony, quartz, quartzite, schist, limestone, granite, serpentine, shell and ivory.

The Evidence of Manufacture of Finished Products at Different Sites

Copper/Bronze: The residue of copper smelting, and the presence of a chisel at Pit H2 at Loebanr suggest the possibility of local manufacture of copper/bronze objects (Stacul 1980b:69).

Ordinary Stone: Ghaligai III has yielded limestone cores (Stacul 1984a:209).

Chart 19a

REGIONS TO THE NORTH OF THE INDUS—NEOLITHIC-CHALCOLITHIC PERIOD (3RD MILLENNIUM–MIDDLE OF 2ND MILLENNIUM BC)

Raw Material	*Bir-kot-Ghundai*	*Loebanr*	*Ghaligai*	*Kherari*	*Aligrama*	*Lalbatai*
Copper/ Bronze	pins, fish-hooks, point, wire	pins, fish-hooks, chisel, wire	spearhead, hook		rod, nail, pin	
Gold	plate fragments			earrings		
Lapis Lazuli	ornaments	ornaments, fragments				
Jade	ornaments	ornaments, beads	beads, pendant			
Shell	ornaments	ornaments	bangle			
Ordinary Stone	Schist mould & disks	Granite quern, celt. Ser-pentine celt. Schist pendant, discoidal objects	Limestone flakes, choppers, scrapers, cores, axe, grinding tool. Granite scrapers, choppers, cores, points, flakes, mace-head, pestle. Schist rubbing grinding tool. Quartzite tools		Granite grinding stones. Schist slab	Limestone spindle-whorls

The Raw Materials Found within the Sub-Region

Ordinary Stone

Almost the entire repertoire of stone tools and implements at Loebanr, Aligrama, Ghaligai and Bir-kot-ghundai (I–IV) are made from pebbles. Stacul (1969a:48–50) has suggested that this was partly due to the presence of a very large and continuous supply of stones such as limestone, granite, schist etc. in the rivers of this region. Even on the hillsides of areas like the Swat valley, where sites like Ghaligai are located, the basic rock deposit is mainly lime-stone (Stacul 1967a:185).

Semi-Precious Stone

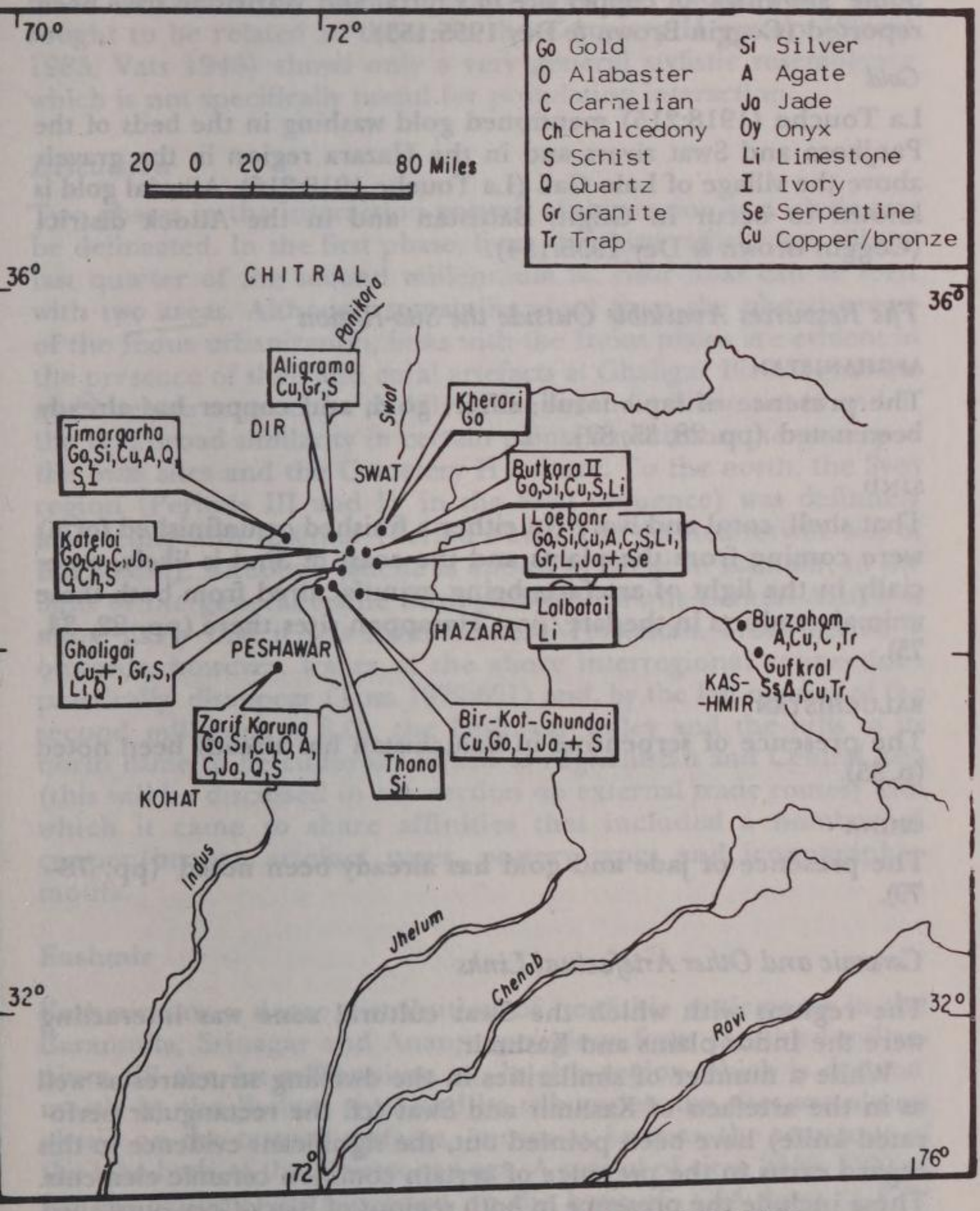
The hills of Waziristan, a section of which falls in this sub-region, are known to contain agate, jasper and the allied varieties of stone which also often occur as river pebbles in the streams which drain these hills (see p. 37).

Chart 19 b

REGIONS TO THE NORTH OF THE INDUS–NEOLITHIC–CHALCOLITHIC PERIOD
15TH CENTURY—9TH/8TH CENTURIES BC

Raw Material	*Zarif Karuna*	*Loebanr*	*Katelai*	*Butkara II*	*Timargarha*	*Thana*
Gold	rings, beads, earrings	earring	earrings	earrings	earring	
Silver	ring	sheets		sheets	earring	ring
Copper/ Bronze	ring	pins, earrings, knife, pendant, buckles, spearhead fragment, beads	pins, beads, earring, fork, pendant, knife, bodkins, needle, hook, figurine	pins, knife blade, buckles, knife, earrings, fragments, hook	pins, toilet objects, needles, rectangular shaped object, hair pin, ring, antimony rod, hooked rod, pendant, earrings, bangle	
Alabaster	figurine					
Agate	beads	beads			beads	
Carnelian	beads	beads	beads			
Jade			bead			
Semi-precious Stone			Onyx beads. Chalcedony beads, disks			
Ordinary Stone	Quartz beads. Schist beads	Schist bead, spindle whorls, maceheads. Limestone macehead. Granite macehead	Schist disks, buttons, mace head	Schist object, buttons. Limestone buttons	Quartz bead. Schist beads	
Ivory					hairpin	

Map 15



NEOLITHIC–CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT– SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE REGIONS TO THE NORTH OF THE INDUS AND KASHMIR

Copper

Some 'showings' of copper ore in Chitral and Waziristan have been reported (Coggin Brown & Dey 1955:153).

Gold

La Touche (1918:215) mentioned gold washing in the beds of the Panjkora and Swat rivers and in the Hazara region in the gravels above the village of Lalo Gali (La Touche 1918:216). Alluvial gold is known to occur in Gilgit, Baltistan and in the Attock district (Coggin Brown & Dey 1955:134).

The Resources Available Outside the Sub-Region

AFGHANISTAN

The presence of lapis lazuli, silver, gold, and copper has already been noted (pp. 28, 35, 82).

SIND

That shell, coral and ivory (in either a finished or unfinished form) were coming from the plains and the coast of Sind is likely, especially in the light of artefacts being manufactured from both these animal products in the late/post Harappan sites there (pp. 22, 34, 75).

BALUCHISTAN

The presence of serpentine in Baluchistan has already been noted (p. 35).

CHINA

The presence of jade and gold has already been noted (pp. 78–79).

Ceramic and Other Artefactual Links

The regions with which the Swat cultural zone was interacting were the Indus plains and Kashmir.

While a number of similarities in the dwelling structures as well as in the artefacts of Kashmir and Swat (cf. the rectangular perforated knife) have been pointed out, the significant evidence in this regard exists in the presence of certain common ceramic elements. These include the presence in both regions of Black-Grey Burnished ware and Brown to Red Gritty wares as well as particular types of pots with rippled rim and mat impression on the base (Stacul 1977:251).

Among the ceramic parallels that were supposed to exist between the Swat sequence and the Harappan civilization, certain faunal representations including peacocks, ducks, the rendering of

birds in sequence with astral symbols and the representation of birds' heads in the form of multi-rayed sun motifs have been sought to be related to those on the Cemetery H pottery (Stacul 1985; Vats 1940) shows only a very general stylistic resemblance which is not specifically useful for postulating interaction.

Discussion

Two phases in the interaction pattern of this region as a whole may be delineated. In the first phase, from the third millennium till the last quarter of the second millennium BC clear links can be seen with two areas. Although remaining aloof from the phenomenon of the Indus urbanization, links with the Indus plains are evident in the presence of shell and coral artefacts at Ghaligai, Bir-kot-ghundai and Loebanr around the middle of the second millennium BC and in the very broad similarity in certain painted motifs on the pottery of the Swat sites and the Cemetery H culture. To the north, the Swat region (Periods III and IV in the Swat sequence) was definitely interacting with Kashmir (Period I and II as defined for the site of Burzahom). Although jadeite is known to occur in Kashmir, in the light of the general traffic through Swat towards Central Asia, it is more likely that it was from Chinese Turkestan. From Period V onwards, however, traces of the above interregional connections practically disappear (Tusa 1979:691) and, by the last quarter of the second millennium B.C., the Peshawar valley and the hills to its north came to be culturally linked to Afghanistan and Central Asia (this will be discussed in our section on external trade routes) with which it came to share affinities that included a number of copper/bronze artefact types, pottery types and iconographic motifs.

Kashmir

Kashmir saw a dense distribution of neolithic settlements in the Baramulla, Srinagar and Anantnag regions from the third millennium till the 1st millennium BC. In this region which is drained mostly by the Jhelum river and its tributaries, the sites are almost always on the terrace surfaces, known as *karewas*, the remnants of the lake beds of the pleistocene age. A spread of circa 2300–1500 BC for this culture was suggested on the basis of C14 dates (*I.A.R.* 1965–6:87). Two such sites have been excavated—Gufkral and Burzahom (*I.A.R.* 1966–7:16–17; 1971–2:23; 1973–4:75; 1976–7:19, 75; 1981–2:19–24; Kaw 1979:219–29; Pande 1970:25–41; Pant 1979).

Chart 20

KASHMIR—NEOLITHIC–CHALCOLITHIC PERIOD

Raw Material	*Gufkral*	*Burzahom*
Steatite	beads	
Carnelian		beads
Agate		beads, pendants
Copper/ Bronze	hairpin	rings, needle, beads
Ordinary Stone	Trap celts. Sandstone ringstone, pounders & querns	Trap celts

The Sitewise Distribution of Raw Materials

A perusal of Chart 20 shows that the raw materials exploited in Kashmir include steatite, carnelian, agate, copper, trapstone and sandstone.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: At Gufkral (IA and IC), unfinished stone celts made of Himalayan trap have been found (*I.A.R.* 1981–2:20).

Copper/Bronze: Burzahom (II) has yielded a crucible (*I.A.R.* 1966–7:17).

The Raw Materials Found within the Sub-Region

Ordinary Stone

Most of the stone tools are made of Himalayan trap which, along with sandstone, the other type of stone from which artefacts were manufactured, were easily available in neighbouring hillsides (for a discussion of the various rock formations, Varadan 1976a: 5–30).

Copper

The copper mineralized zones of Kashmir are extensively reported (Varadan 1976a:44–6; Raghunandan et al. 1981:186–7). Occurrences have been recorded in the following regions:

Anantnag district: On the slopes of the Mammal and Dunpathri, malachite stains and old workings were noted in 1960. In the Shumahal area sporadic mineralization has also been reported;

Baramulla district: Pyrite and arsenopyrite have been noted at the Lashteal hill spur;

Doda district: In the Banihal area, the occurrences are at Rollu and Duligam. Old mines and pits were found at Rollu. Seventeen old workings were also noticed at Duligam;

Ladakh district: Copper mineralization has been noticed in several localities in the Doa and Luneak valleys of the Zanskar area.

The Raw Materials Available Outside the Sub-Region

SWAT/WAZIRISTAN

The presence of the chalcedonic varieties of semi-precious stones in this region has already been noted (p. 37).

CENTRAL ASIA

The traditional and well-developed lapidary industry in Kashmir used to get most of the semi-precious stones from Central Asia through Ladakh. C.G. Bruce (1915:44), for instance, noted that 'the very best stones such as agate, cat's eye, bloodstone, jade, crystal and rough turquoise are imported from Ladakh and Yarkand, where the Tibetan women wear marvellous ornaments of chased brass and rough turquoise, coral and amber.'

Ceramic and Other Artefactual Links

Kashmir was oriented towards the North-West Frontier province and, lower down, the Indus valley. While the links with the North-West frontier province have already been noted (p. 150), the presence at Burzahom (II) of a globular pot with a horned deity painted on its shoulders bearing a very strong resemblance to similar types at Kot Diji and Gumla is suggestive of links with the Indus plains (illustration in Agrawal 1982:102). Also, at Gufkral (IC) a copper hairpin with a flattened coiled head similar to the one found at Chanhu-daro, is reported (*I.A.R.* 1981–2:23).

Discussion

The commonality of a number of ceramic traits between the Kashmir and Swat neolithic cultures is evocative of the communication between them. Furthermore, some semi-precious stones from the Waziristan hills which abound in boulders of the chalcedony varieties could come through Swat to Kashmir. Its links with the Indus region are not very clear, although we have drawn attention to the Kot Dijian 'horned deity' at Burzahom and a single spiral-headed copper artefact at Gufkral.

North-East Rajasthan

That a major chalcolithic complex existed in north-east Rajasthan, with the Sikar district forming the core region, was confirmed in a most spectacular fashion in 1977 by R.C. Agrawala with the identification of Ganeshwar. Sites of what is inaccurately called the

ochre-coloured pottery ware had been identified, and excavations were carried out, at the major centre of Jodhpura in Jaipur district much earlier (Agrawal & Kumar 1982; Agrawala 1979, 1980, 1981a, 1981b, 1984; *I.A.R.* 1972–3; 1973–4; 23–24), although this culture was subsequently christened the Ganeshwar-Jodhpura complex. No radio-carbon dates are available from Ganeshwar, although on the basis of the C14 dates from Jodhpura as well as the artefactual affinities with the copper implements of the pre-Harappan/ Harappan cultural levels, an early third millennium date has been suggested. This complex is marked by an impressive metallurgical repertoire with large-scale evidence of copper smelting together with the presence of a microlithic tradition connected in all probability with a hunting-gathering way of life.

The Sitewise Distribution of Raw Materials

A reading of Charts 21a–b testifies to the nature of resources exploited. These are quartz, chalcedony, jasper, chert, garnet and copper/bronze.

The Evidence of Manufacture of Finished Products at Different Sites

Copper/Bronze: Slag and/or evidence of copper smelting is available from Gaonri, Gaonri Bandh, Kulra, Nimodh, Para Bhitar-ki-Dhani, Umrawala (*I.A.R.* 1978–9:20), Chinchroli (*I.A.R.* 1980–1:56), Banar, Oda-ki-Dhani, Aheerawala, Basedi, Bihar, Chamrauli, Delsar, Dhoonwala, Dilpura, Golyari, Khadra, Khalra, Kishore Para, Loharwas Sota, Mungter, Purana Mothuka, Pyopara, Tigri (*I.A.R.* 1979–80:62–5) and Buchera (Agrawala 1981a:60).

Ordinary Stone: Cores and flakes in quartz, chert and other stones were reported from Ganeshwar (*I.A.R.* 1980–1:61).

The Raw Materials Found Within the Sub–Region

Copper

The large-scale occurrence of copper mineralization over almost the whole of Rajasthan has already been noted (Chart 7). More specifically, the sites of the Ganeshwar/Jodhpura cultural complex seem to have used the ore resources in their immediate vicinity. The probability of Ganeshwar using the copper mines of the Khetri region has been pointed out by Agrawala (1979:91). Buchera, at the source of the Sota river, where slag was found, is situated close to the copper mines of Ahirwala and Cheeplata (Agrawala 1981a:60). At Behar also, on the bank of the Dohar river, where

Chart 21 a

NORTH-EAST RAJASTHAN—NEOLITHIC-CHALCOLITHIC PERIOD

Site	*Copper/Bronze*	*Stone*
Ganeshwar	axes, arrowheads, spearheads, chisels, fishhooks, rings, , hairpins, bangles, rods, bells, celts	Quartz, Chalcedony, Jasper, Chert, Garnet microliths
Buchahar	bead	
Jambalpur	slag	
Chinchroil	slag	
Bahar	ore	
Oda-Ki-Dhani	slag	
Aheerwala	slag	
Basedi	slag	
Bhoodoli	indeterminate objects	
Bihar	slag, indeterminate objects	
Chamrauli	slag	
Delsar	slag	
Dhooniwala	slag	
Dilpura	slag	
Balwara	slag	

Chart 21 b

NORTH-EAST RAJASTHAN—NEOLITHIC-CHALCOLITHIC PERIOD

Site	*Copper*
Gaonri	slag
Gaonri Bandh	slag
Golyari	slag
Khalra	slag
Kulra	slag
Kishore Para	slag
Kuradhan-Ki-Dhoongri	arrowheads
Loharwas Sota	slag
Nimodh	slag
Para Bhitar Ki-Dhani	slag
Purana Mothuka	slag
Pyojara	slag
Tigri	slag
Umrawala	slag

several sites which yielded copper artefacts are known, old copper workings have been reported (Agrawala 1981a:60).

Ordinary and Semi-Precious Stone

Stones like quartz, chert, garnet, chalcedony and occasionally jasper that were manufactured into microliths at Ganeshwar, and were also, in all probability, utilized in the microlithic assemblages of other sites were locally available. According to Agrawala (*I.A.R.* 1981–2:61), they can be obtained in the veins of the gneissic formations and limestone outcrops in the immediate vicinity of Ganeshwar.

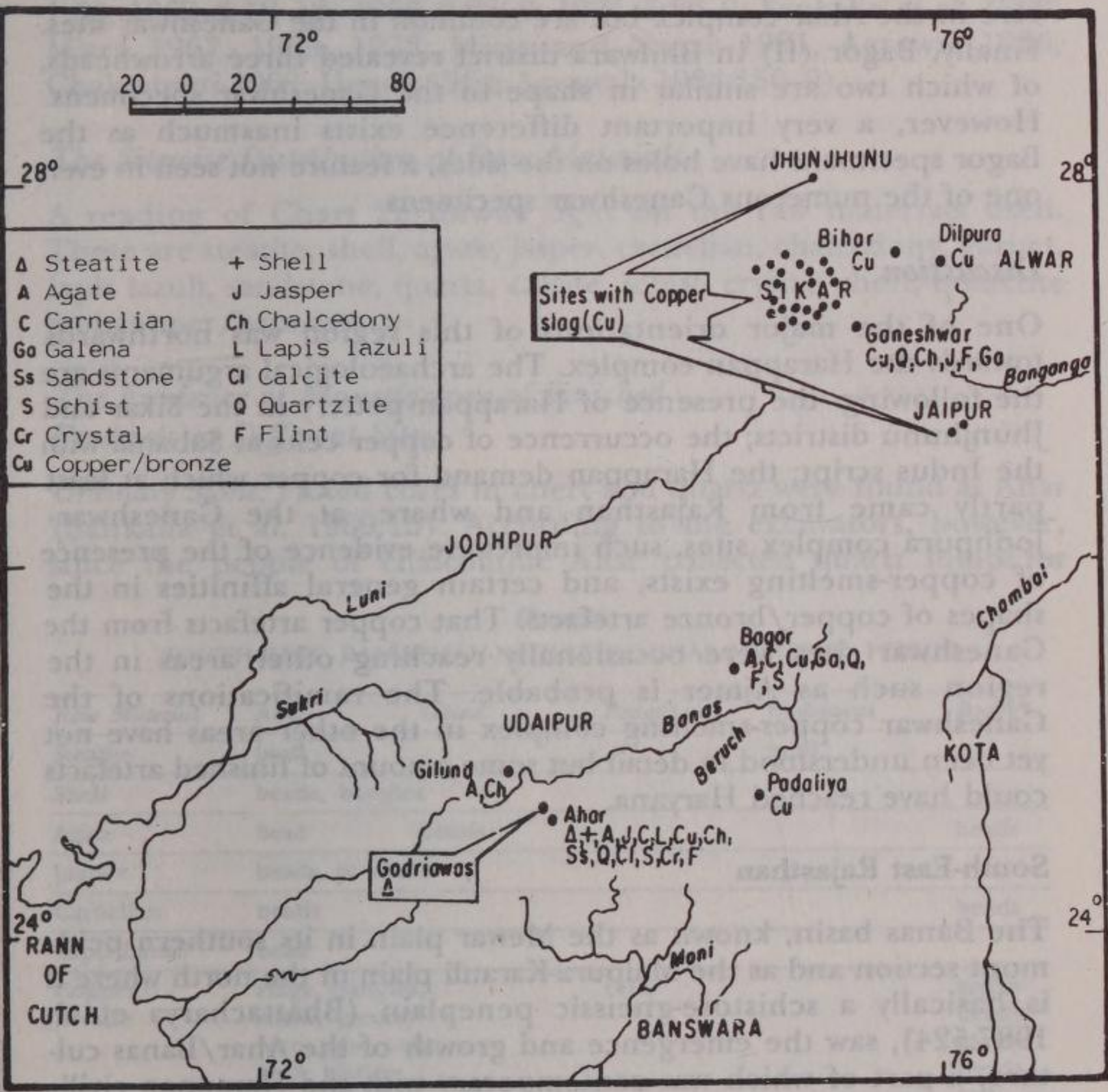
Ceramic and Other Artefactual Links

Apart from intra-regional evidence of interaction, north-east Rajasthan shared a number of artefactual affinities with the Harappan civilization.

Affinities between the Ganeshwar/Jodhpura complex and the pre-Harappan and Harappan culture sites have been suggested on the following grounds. To begin with, the profuse linear designs on the exterior of some ceramics of this culture are similar to those on a few of the pre-Harappan fabrics at Kalibangan I, Sothi, Siswal, Bara and some sites in Punjab, Haryana and western Uttar Pradesh (Agrawala and Kumar 1982:126–7). However, as the geographical areas mentioned above make clear, such designs cover such a vast area so as to be too general for making any useful correlations. Much more significant is the occurrence of Harappan pottery along with microliths at the sites of Dadiya Pajyali in the Sikar district as well as at Chava Siri in Jhunjhunu district where Harappan pottery has also been found (*I.A.R.* 1980--1:56; 1981–2:62). Various copper/bronze artefacts that include arrowheads from Ganeshwar, mostly of the barbed variety, are similar to specimens found in limited numbers at Banawali, Kalibangan, Lothal, Harappa, Mohenjo-daro, Chanhu-daro. Also the Ganeshwar spearheads (the thick variety) resemble examples found at Harappa and Mohenjo-daro, while similar fish hooks are found at Harappa, Mohenjo-daro and Banawali. A double spiral-headed copper pin from Ganeshwar is also a type found in the Harappan distribution area and is of supposed West Asiatic affinities (Agrawala and Kumar 1982:126–7; *I.A.R.* 1981–2:61).

Certain similarities in copper objects between the Ganeshwar/Jodhpura complex of sites and other cultural material from Rajasthan have also been noted. At Buddha Pushkar, a fish hook similar to the specimens from Ganeshwar was found by B. Allchin (Agrawala and Kumar 1982:50). From the Kurada copper hoard, of which only a section has survived and is presently kept at the Gurukul Museum, Jhajjar, a celt with four indentations in a single line, one below the other was discovered (Agrawala and Kumar 1982:128). From the Ahar culture site of Pind Padaliya, six copper

Map 16



NEOLITHIC–CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT– SITEWISE DISTRIBUTION OF RAW MATERIALS IN RAJASTHAN

celts of the Ganeshwar type were recovered (Agrawala and Kumar 1982:130). Although the celts are not identical, such long celts are rare in the Ahar complex but are common in the Ganeshwar sites. Finally, Bagor (II) in Bhilwara district revealed three arrowheads, of which two are similar in shape to the Ganeshwar specimens. However, a very important difference exists inasmuch as the Bagor specimens have holes on the sides, a feature not seen in even one of the numerous Ganeshwar specimens.

Discussion

One of the major orientations of this region was northwards towards the Harappan complex. The archaeological arguments are the following: the presence of Harappan pottery in the Sikar and Jhunjhunu districts; the occurrence of copper celts at Sabania with the Indus script; the Harappan demand for copper which at least partly came from Rajasthan and where, at the Ganeshwar-Jodhpura complex sites, such impressive evidence of the presence of copper-smelting exists, and certain general affinities in the shapes of copper/bronze artefacts. That copper artefacts from the Ganeshwar sites were occasionally reaching other areas in the region such as Ajmer is probable. The ramifications of the Ganeshwar copper-smelting complex in the other areas have not yet been understood in detail but some amount of finished artefacts could have reached Haryana.

South-East Rajasthan

The Banas basin, known as the Mewar plain in its southern peidmont section and as the Malpura-Karauli plain in the north where it is basically a schistose-gneissic peneplain (Bhattacharya et al. 1987:524), saw the emergence and growth of the Ahar/Banas culture, a part of which was contemporary with the Harappan civilization. Affinities between the Ahar culture and the upper levels of the mesolithic site of Bagor, which is located on a tributary of the Banas, have been pointed out (Misra 1973:103). Over fifty sites of this culture are distributed in the valleys of the Banas and its tributary system comprising the Berach, the Kothari, the Khari, the Dai, the Sodra and the Mashi, and their smaller tributaries in the districts of Udaipur, Chitorgarh, Bhilwara, Tonk, Ajmer and Jaipur in Rajasthan, and district Mandasor in Madhya Pradesh (Misra 1969:298). Ahar sites today have been found outside the Banas zone as well as for instance, at Depura, Aspura, and Karelia in Dungarpur district (Agrawala 1984:159). The settlement pattern of the Ahar culture, the nature of its copper technology and its other basic features have been clearly outlined over the years since the

first excavation at Ahar in the early 1950s (I.*A.R.* 1954–5:14–15; 1956–7:8; 1955–6:11; 1957–8:43–4; 1958–9:45–6; 1959–60:41–6; 1960–1:66; 1962–3:18–19; 1968–9:26–8; 1984–5:66–9; Sankalia et al. 1969; Misra 1967, 1969, 1973; Misra and Nagar 1981; Agrawal 1966; Chakrabarti 1968; Hegde 1964; Agrawala 1984:156–9).

The Sitewise Distribution of Raw Materials

A reading of Chart 22 throws light on the raw materials used. These are steatite, shell, agate, jasper, carnelian, chalcedony, garnet, lapis lazuli, sandstone, quartz, calcite, schist, crystal, chert, quartzite and copper/bronze.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Fluted cores in chert and quartz were found at Ahar (Sankalia et al. 1969:15). According to the excavators, however, since the people of chalcolithic Ahar collected quartz lumps for

Chart 22

SOUTH-EAST RAJASTHAN-NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Ahar*	*Gilund*	*Padaliya*	*Gadriawas*	*Bagor**
Steatite	bead			bead	
Shell	beads, bangles				
Agate	bead	beads			beads
Jasper	beads, pendant				
Carnelian	beads				beads
Lapis Lazuli	bead				
Copper/ Bronze	rings, bangles, sticks, pieces, wire, tube, celts, knife blades		celts		arrow-heads, spear-heads, awl, pieces
Semi-Precious Stone	Chalcedony blades, cores	Chalcedony blades			Garnet ornaments
Ordinary Stone	Sandstone mullers, anvils, saddlequerns. Quartz mullers, cores, scrapers, borers, lumps. Calicite bead. Schist macehead, beads, slabs. Crystal bead. Chert cores. Quartzite mullers				Quartz & Chert micro-liths. Schist slabs

* Bagor is a mesolithic site.

mixing with mud for constructing house walls, these tools and cores were similarly collected and are therefore found in the wall debris. However, microliths—blades, fluted cores—were discovered during the first excavation of Ahar as well (*I.A.R.* 1954–5:14–15; 1955–6:11). The stone artefacts which were definitely manufactured at the site are maceheads of schist and sandstone; some fragments of macehead specimens show the different stages of manufacture (Sankalia et al. 1969:212).

Semi-Precious Stone: Ahar has yielded fluted cores in chalcedony (Sankalia et al. 1969:15).

Copper/Bronze: Ahar (I) yielded heaps of slag-like material (Hegde 1969:226). This slag-like material was found in a specially made round pit which has been interpreted as being been part of a furnace.

Shell: The evidence for the local manufacture of shell artefacts at Ahar is as follows: (i) file abrasions on beads and bangles and (ii) numerous waste pieces of shell columellas (Sankalia et al. 1969:175, 204).For instance, No. 7 in Fig. 124 of the report is a cylindrical piece of columella (Sankalia et al. 1969:206).

The Raw Materials Found within the Sub-Region

Almost all the resources used at the Ahar culture sites could be obtained within the region itself. Spectroscopic analysis of samples from certain copper artefacts of Ahar and chalcopyrite copper ore from Khetri have revealed almost identical impurity patterns (Hegde 1969:255). Other materials like jasper, agate, chalcedony, etc. are also all available in abundance (p. 49). Somestones, as for instance, the schist used in making the plinths of houses at Ahar occur in outcrops all around the site.

The Raw Materials Available Outside the Sub-Region

AFGHANISTAN

Lapis lazuli is known to occur in Afghanistan (p. 28).

BALUCHISTAN

Lapis lazuli is found in Baluchistan (pp. 20–22).

Ceramic and Other Artefactual Links

The Ahar cultural zone shared a number of ceramic and artefactual links with Gujarat and Malwa.

Although ceramic affinities between Gilund and the Harappan civilization have been outlined (Agrawal 1966), the undeniable evidence of Harappan contact comes from Ahar where etched car-

nelian beads, both spherical and barrel have been found (*I.A.R.* 1955–6:11; Sankalia et al. 1969:165). Also, the only specimen of a lapis lazuli bead at Ahar may have been of Harappan provenance. In this regard, the occurrence of both etched carnelian and lapis lazuli beads at Lothal is significant. Since the late/post Harappan lustrous red ware of Gujarat is also found at Ahar, it is likely that the above-mentioned beads had also come from the same region. The Rangpur Lustrous Red ware at Ahar (IC) has been divided into as many as many as eight categories (Sankalia et al. 1969:138). These fragments suggest the following shapes—high-necked pots with possibly elongated body, vessel with constricted neck, globular pots, storage jar and flared dish. The designs include horizontal bands below the neck, hatched diamonds, bands with lower caps that connected loops, groups of wavy lines, hatched triangles and wavy vertical lines.

The links with Malwa are amplified in the existence of an Ahar cultural level at Kayatha and Ahar ware at sites in the Mandasor and Shajapur districts (*I.A.R.* 1969–70:17). Ceramic affinities in the form of shapes ie., carinated bowls and bowl with straight slightly outward-inclined sides at Ahar Ic and Ia and Phase III at Navdatoli (Sankalia et al. 1969:220), and designs such as a double row of dotted zigzag and dotted chevron with vertical arch at Ahar and Navdatoli (Sankalia et al. 1969:220) have also been noted. In fact, the second design at both sites occurs on the same ceramic type ie., a carinated bowl. By the Jorwe period, the links become less defined with only a single sherd of Jorwe ware at Ahar.

Discussion

The Ahar culture was clearly oriented towards the Malwa plateau, on the one hand, and Gujarat on the other. The presence of an Ahar level at Kayatha and of the Ahar ceramics at a number of sites in the Malwa region underlines the closeness of this interaction (this is discussed in detail in the next section). From Gujarat, finished commodities (lapis lazuli and etched carnelian beads), sea shells for local manufacture, and Lustrous Red ware reached the Banas basin.

Malwa

Malwa, in its widest sense, includes all the land between the Vindhyas and a point just south of Gwalior; its eastern limit is marked by a ridge which goes from south to north near Vidisha, while, its western limit lies near the Rajputana border (Bhattacharya 1977:xvi). Settled life in this region began around the beginning of the second millennium with the Kayatha cultural hori-

zon, dated, at the type site of Kayatha in the Ujjain district, from as early as 2000 BC. As it unfolded and flowered into a major chalcolithic phenomenon known as the Malwa culture, it came to embrace the valleys of a large number of rivers that intersect the area such as the Chambal, Ken, Kali Sindh, Mahi, Sipra and the Narmada. The pioneering work on the Malwa chalcolithic was done by the Vikram University, Ujjain, and in particular by V.S. Wakankar (1967, 1968–9, 1982; *I.A.R.* 1968–9:66; 1966–7; 1969–70: 16–17; 1979–80:54–5), although the major sites have been excavated and the sequence of cultures clearly enunciated on the basis of the work of the Deccan College, Poona (Ansari and Dhavalikar 1975; Sankalia et al. 1971; Sankalia et al. 1975; M.G. Dikshit 1955; Sankalia et al. 1958). The Archaeological Survey of India's excavation at Nagda (Banerjee 1986) and the efforts of some other individual workers in the field (Khare 1980–1, 1982; Sharma and Ali 1980; Khera 1982) are also noteworthy.

The Sitewise Distribution of Raw Materials

Chart 23 clearly outlines the nature of raw materials exploited by this cultural complex. These are quartz, haematite, trapstone, chert, crystal, malachite, chalcedony, quartzite, carnelian, agate, jasper, sandstone, amazonite, opal, lapis lazuli, shell, steatite, gold, ivory, marble, slatestone and jade.

The Evidence of Manufacture of Finished Products at Different Sites

Stone: Evidence of the local manufacture of microliths and other stone objects is available from Navdatoli, Tripuri, Nagda and Kayatha. At Navdatoli (Sankalia et al. 1971:270)the blade industry was a well developed household industry with cores, flakes and other types of tools evenly distributed throughout the habitation areas. Sankalia et al. (1958:43–6) had earlier noted that a kind of factory site had been found at Mound I (trench II) where 630 of the 689 specimens found were small, irregular thin flakes. In addition to this, a large number of irregular and semi-cylindrical cores with natural faults, nodules and cores were also noted. At Tripuri (M.G. Dikshit 1955:20), banded agate cores and a chalcedony core are reported. From Nagda (Banerjee 1986:210) at least eight fluted cores, four fluted and cross flaked cores and twenty-seven primary assymetrical flakes have been reported. The specialized blade industry of Kayatha has yielded a number of chalcedony cores (Ansari and Dhavalikar 1975:111–15).

The other stone objects that were manufactured at the site of Navdatoli were ring stones where eleven unfinished specimens

Chart 23

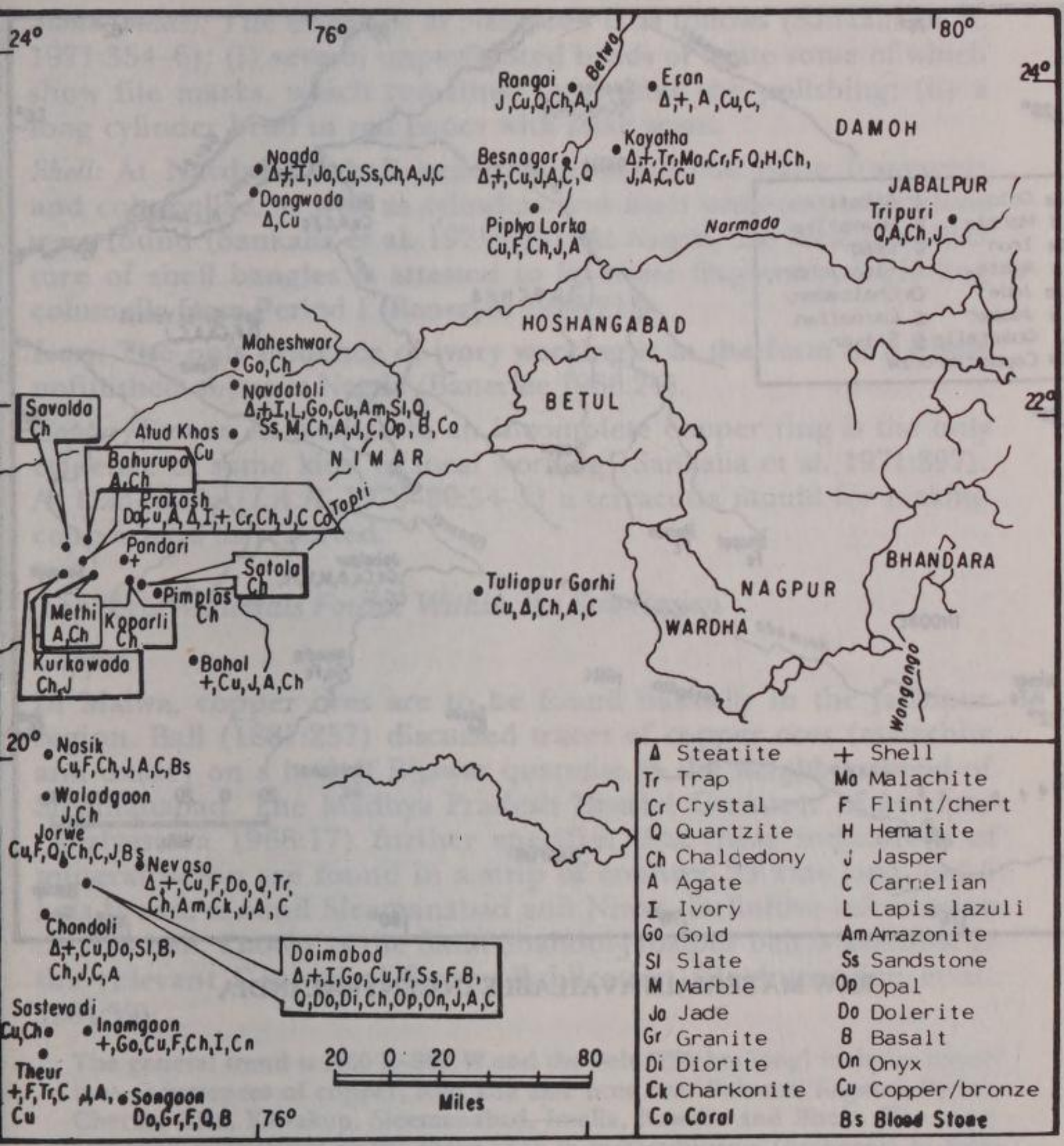
CENTRAL INDIA–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Kayatha*	*Navdatoli*	*Tripuri*	*Rangai*	*Nagda*	*Atud Khas*	*Pipliya Lorka*	*Dang-wada*	*Eran*	*Besnagar*	*Mahesh War*
Steatite	beads	beads			bead			bead	beads	beads	
Shell	beads	beads, studs, waste pieces, spindle-whorls			bangles				rings, beads, bangles, pendants	beads	
Coral		beads									
Ivory		disc			unfinished object, bangles						
Jade					beads						
Lapis Lazuli		beads									
Gold		beads									piece
Copper/ Bronze	bangles, axes	celts, chisels, arrowheads, sword fragment, nails, fish hooks, rods, engravers, beads, ring, bangles, lumps, pieces, sheet fragments, cones, wire		rod	foil, bangles, fragments	unspecified objects	strips, bangle pieces, rods	unspecified object, chisel	unspecified object, piece	circular & indeterminate objects	

(*Chart 23 Contd*)

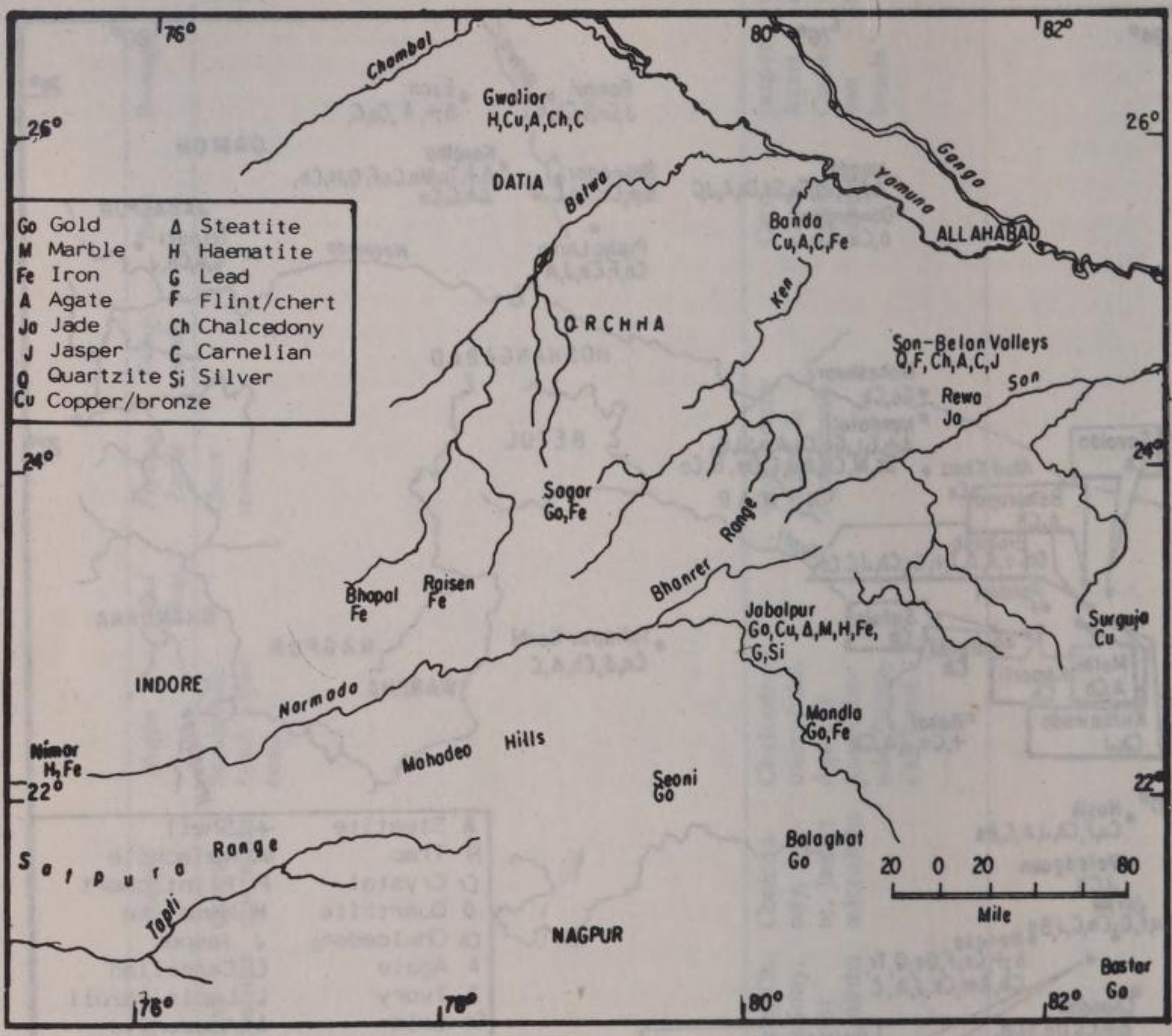
Raw Material	*Kayatha*	*Navdatoli*	*Tripuri*	*Rangai*	*Nagda*	*Atud Khas*	*Pipliya Lorka*	*Dang-wada*	*Eran*	*Besnagar*	*Mahesh War*
Ordinary Stone	Trapstone pestles, rubber stones, hammerstones, balls. Malachite beads. Crystal beads. Chert blade. Quartz ball. Haematite ball	Amazonite bead, Slatestone anvils, mullers, beads. Quartz beads, ringstones, grinding stones, querns, microliths. Quartzite ringstones, hammerstones, grinding stones, querns, balls. Sandstone beads, ring stones, grinding stones, querns. Marble object. Basalt ringstones, grinding stones	Quartz microliths	Quartz microliths	Sandstone bead. Dyke bead		Chert tools				Quartz blades
Semi-Precious Stone	Chalcedony microliths, including cores, flakes. Jasper, Agate & Carnelian beads. Agate blade	Chalcedony beads, blades, cores, chips, nodules, rejects. Jasper, Agate, Carnelian microliths & beads. Opal beads	Agate, Chalcedony, Jasper microliths	Chalcedony, Agate, Jasper microliths	Chalcedony microliths. Agate & Jasper beads. Carnelian bead		Chalcedony Jasper & Agate tools		Carnelian, Agate beads	Jasper, Agate & Carnelian beads	Chalcedony microlths

Map 17



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT– SITEWISE DISTRIBUTION OF RAW MATERIALS IN CENTRAL INDIA AND MAHARASHTRA

Map 18



RAW MATERIALS AVAILABLE IN CENTRAL INDIA

were found; all of these specimens were unbored (Sankalia et al. 1971: 327).

Stone (beads): The evidence at Navdatoli is as follows (Sankalia et al. 1971:354–6): (i) several unperforated beads of agate some of which show file marks, which remained even after the polishing; (ii) a long cylinder bead in red jasper with flake scars.

Shell: At Navdatoli, shell beads with numerous waste fragments and columellae, as well as cylinders and discs without perforations were found (Sankalia et al. 1971:356). At Nagda, the local manufacture of shell bangles is attested to by waste fragments, including columella from Period I (Banerjee 1986:218).

Ivory: The only evidence of ivory working is in the form of a single unfinished object at Nagda (Banerjee 1986:24).

Copper/Bronze: At Navdatoli, an incomplete copper ring is the only evidence of some kind of local working (Sankalia et al. 1971:397). At Dangwada (*I.A.R.* 1979–80:54–5) a terracotta mould for making copper axes iis reported.

The Raw Materials Found Within the Sub-Region

Copper

In Malwa, copper ores are to be found basically in the Jabalpur region. Ball (1881:257) discussed traces of copper ores (malachite and oxide) on a bed of Bijawar quartzite in the neighbourhood of Sleemanabad. The Madhya Pradesh District Gazetteer of Jabalpur (Shrivastava 1968:17) further specifies that these indications of mineralization are found in a strip of country, 29 kms long and 5 kms broad, around Sleemanabad and Niwar. Definitive information on this belt, known as the Sidhi-Shahdol-Jabalpur belt is available in the relevant Geological Survey Publication (Raghunandan et al. 1981:39):

> The general trend is N60 E–S60 W and the belt (250 km long) includes important occurrences of copper, lead and zinc ores near Sukwari, Bagwari, Byriah, Cherke, Kira, Kawakup, Sleemanabad, Imalia, Nawalia and Bhula. The mineralization is confined to the shear zone in metasediments (Archeans) in Sidhi district, along the shear zones in phyllites (Precambrian) in Shahdol district, and along fault zones within the dolemites in Jabalpur district. A major portion of the belt is under an alluvial cover.

Gold

The presence of auriferous sands in most parts of the old Central Provinces where there were exposures of older crystalline rocks was noted by Ball (1881:199–203). The number of professional gold washers in different parts of Malwa in 1872 is specifically mentioned by him: 52 in Jabalpur and 19 in Sagar. Ziauddin and Narayanaswami (1974:138–40) mention gold occurrences in a num-

ber of districts, while some details on the Jabalpur district are also available (Shrivastav 1968:23). The following account is based on the above-mentioned sources.

Balaghat district: The sands of the Son and Deo rivers in the Lanji pargana, the Nahr river from Mau, and Pancheraghat on the Sonabera river contain alluvial gold;

Bastar district: Gold is reported to be present in the Bhimsen and Chakabuka rivers and in the streams south of Malkangiri as well as at Supanar Ghat in the Sabari river. Gold also occurs in the Koti stream, the Kolar river, Pratabpur, and from Bharamgarh at the junction of the Kathari and Indravati rivers;

Mandla district: Gold was said to have been washed in the Banjar;

Seoni district: Gold washing had been carried out in the Pachdhar and Bawenthuri;

Jabalpur district: In Sleemanabad, metalliferrous lodes have been found to contain a certain portion of gold varying from insignificant quantities to 15 cwts of gold. To the south-east of Sleemanabad also, in the prospecting done by the Bauxite and Chemical Development Syndicate Ltd., the samples assessed carried 0.2 to 0.8 cwts of gold per tonne. The veins of blue quartz in the area gave gold values up to 3 to 4 cwts per tonne.

Steatite

Although no detailed information was then available, steatite bands were known to occur in various districts of the former Central Provinces (of which the Malwa plateau formed a part) in the nineteenth century. Ball (1881:413) cited the information from a Mr Wilkinson who in 1843 noted that steatite sold at 10 seers for a rupee in Nagpur. It was supposed to have been obtained from Jabalpur district. The Jabalpur district gazetteer (Shrivastav 1968: 23) mentions specific localities in this regard: Lalpur, Dandara, Gawari, Bheraghat, Rithori, Khamaria, Bhaganwara, Manhera, Bhijhota, Uchera, Tedki, Bhatgawan, Deorihatai and Kodo.

Ivory

Considering that even till the recent past, wild elephants used to occasionally stray into some of the districts of the region (Guru 1976:29), in the protohistoric period, the elephant was undoubtedly a part of the local fauna.

Ordinary Stone

Sandstone, quartz, quartzite, trap, chert, pebble and marble were all locally available. The greater part of the region is covered by basalt or trap. In fact in Nimar (Russell 1908:8) 'with the exception of a fringe of ground by the Nerbudda, in the most northern part of the

District, and of the alluvial tract around Burhanpur. . . .the entire District is covered by trap rocks.' Also sandstone and dolomitic limestone, usually banded with chert, occur in West Nimar (Shrivastav 1970:13–14). In Jabalpur district, the marble rocks of the Narbada gorge (Srivastav 1968:10) are the best known source of this stone. The other stones available in the district are limestone, quartzite and schist.

Semi-Precious Stone

Large parts of central India are covered with Deccan trap formations in which geodes containing semi-precious stones are extremely common. These stones are also often found in the rivers of the region. The bed of the Narmada river, for instance, in many places is known to contain onyx and amethyst, among other varieties of chalcedony (Shrivastav 1968:23). The presence of both these varieties is obvious from a reading of the gazetteers and archaeological reports. Chalcedony is found not only in the amygdoloidal basalts (Russell 1908:147; Srivastav and Sharma 1979:9; Srivastav 1968:10) but also in the river gravel as pebbles and nodules (Sankalia et al. 1971:270). Agate is also commonly available, along with jasper, in the trap rock of the region in a fairly widespread manner. Furthermore, opal is common in parts of the Deccan trap areas in nodules of various sizes (Mallet 1887:80).

Haematite

Mallet (1887:49) in Part IV of *A Manual of the Geology of India*, while commenting on the widespread occurrence of this mineral in India, noted that there were some extremely rich deposits such as those in the Nimar, Bijawar and Gwalior while others such as those in the Jabalpur district, occurred as entire hills of the mineral.

Jadeite

Jadeite of the nephrite variety was mentioned by Pascoe (1931:683) as occurring in the old Rewah state of central India.

The Raw Materials Available Outside the Sub-Region

GUJARAT

The occurrence of sea shells and amazonite in Gujarat has already been noted (pp. 79, 106).

AFGHANISTAN AND CENTRAL ASIA

The presence of lapis lazuli and jade has already been noted (pp. 28, 78–79).

RAJASTHAN

The copper resources of Rajasthan have already been noted (Chart 7).

Ceramic and Other Artefactual Links

The basic links of Malwa were with Rajasthan, Maharashtra, Gujarat and the Deccan. The ceramic affinities with Maharashtra and other parts of the Deccan will be discussed in the subsequent sections (see pp. 180–81, 207).

Links between Malwa and Rajasthan have been postulated mainly on the basis of the presence of an Aharian phase at Kayatha (Ansari and Dhavalikar 1975:48), dated between 1700 to 1500 BC and marked by three district ceramic types ie., the Black-and-red Painted and Plain ware, a Red Slipped ware and a coarse grey/red ware which share no similarities with the preceding Kayatha phase but which show a very strong relationship with the essentially Rajasthan-based Aharian culture. At Dangwada and Runija (*I.A.R.* 1980–1:39) in the Ujjain district (*I.A.R.* 1979–80:54), Jharda and Narayangad in Mandasor district (*I.A.R.* 1969–70:17), Badnagaon, Sipawara, Soyat and Susner in Shajapur district (*I.A.R.* 1969–70:17) black-and-red ware of Aharian fabric has been noted.

Late Harappan sites have been discovered at Sihoniya (three sites), Khudai (two sites) and Basaiya (*I.A.R.* 1981–2:31); this spread of the late Harappan horizon into Malwa was probably of Gujarat origin. The finds include stray potsherds of the late Harappan, sturdy and thick red ware of fine fabric with such types as dish-on-stand, vase with disc base, etc. Also the late/post Harappan Lustrous Red Ware of Gujarat provenance has been found at Dangwada and at sites in the Morena district (*I.A.R.* 1981–2:31–2).

Discussion

That the Malwa plateau and Rajasthan were closely interlinked has already been stressed. In fact, as we subsequently argue, this section of central India was the corridor through which various routes to Rajputana from Gujarat and further down, Maharashtra were mediated. At the same time, Malwa was much more than a land of transit in relation to Gujarat and it was from there that a late/post Harappan thrust emanated. Raw materials like shell, which were locally manufactured into artefacts at Navdatoli were also from Gujarat. The affinities with Maharashtra were equally close although, by the Jorwe period, the latter region became more southward oriented.

Maharashtra

The Maharashtra plateau is geographically a region of striking homogeneity and 'characterized by mesas at variable altitudes and the wide open valleys in which the present rivers appear like misfit streams' (Dikshit and Singh 1987:698). The cultural sequence of the Maharashtra plateau is perhaps one of the most securely dated and well researched sequences in Indian archaeology, an achievement which has taken place only in the post-independence period under the auspices of the Deccan College, Pune and under the pioneering leadership of H.D. Sankalia and his colleagues, although some dissatisfaction has been recently expressed (Miller 1984). Nevasa, Nasik, Jorwe, Chandoli, Songaon and Inamgaon, among other sites, have been excavated and scientific studies conducted on different categories of artefacts as well as on various aspects of the sites themselves (Sankalia et al. 1960; Sankalia et al. 1975; Sankalia and Deo 1955; Deo & Majumdar 1969; Deo and Ansari 1965; Dhavalikar et al. 1988; Ansari 1978–9; Dhavalikar & Marathe 1978–9; Shinde 1985; Gogte 1984; Kshirsagar 1983; Dhavalikar & Possehl 1974; Sankalia 1977; Dhavalikar 1977; Badam 1977). The Archaeological Survey of India has also taken considerable interest in the region, having excavated Bahal, Prakash, Daimabad and more recently Tuljapur Garhi (*I.A.R.* 1956–7; Thapar 1964 & 65; Sali 1986; *I.A.R.* 1984–5: 48–50).

The Sitewise Distribution of Raw Materials

Charts 24a–b clearly amplify the raw materials used. These are chalcedony, onyx, opal, jasper, bloodstone, amazonite, charkonite, agate, trap, chert, carnelian, sandstone, quartz, dolerite, granite, basalt, quartzite, slates, diorite, rock crystal, copper, gold, ivory, steatite, and shell.

The Evidence of Manufacture of Finished Products at Different Sites

Stone: Evidence of the local manufacture of microliths is available from the Nasik, Jorwe, Nevasa, Chandoli, Daimabad, Inamgaon, among others. At Nasik a number of cores, chips and nodules, mainly of chalcedony, but including some specimens of jasper and bloodstone were found (Sankalia and Deo 1955:34–6). Jorwe has also yielded a large number of unworked specimens as well as cores (at least fifty cores) and flakes mainly in chalcedony, and, in lesser quantities, in carnelian, jasper and chert (Sankalia and Deo 1955:151). At Nevasa (Sankalia et al. 1960:115), stone tools were being made in each house since debitage associated with it—cores

Chart 24 a

MAHARASHTRA–NEOLITHIC–CHALCOLITHIC PERIOD

Raw Material	*Nasik*	*Jorwe*	*Kopargaon*	*Nevasa*	*Bahal*	*Inamgaon*	*Singaon*	*Chandoli*	*Daimabad*
Steatite				beads				beads	beads
Shell				beads	beads	beads, fragments		beads, fragments	beads, pieces, bangles
Ivory						tusk, bangles, beads			bead
Gold						beads			beads
Copper/ Bronze	rods, fragments, ring, bangle, handle-like object, dish	axes, bangle		chisel, poker, bangles, beads, utensil, blade	lump	pieces, bracelets, anklets, axes, chisels, pokers, fish hooks, tongs		beads, chisels, celt, dagger, fish hooks, bangles, ring, rod, anklet	sculpture, bangles, celt, lump, slag, wires, spearhead, razor, piece
Ordinary Stone	Chert flake	Chert & Quartz microliths		Chert bead, cores and microliths. Dolerite celts, flakes, hammer stone, axe. Quartz fabricators. Trap sling ball, fabricator, hammerstones, anvils,		Chert drill	Dolerite edge tools, hammer, Granite axe. Chert/Quartz hammerstone. Quartzite ha-	Dolerite axes, adze. Slatestone beads. Basalt querns, rubber-stones, pounders, balls	Trap cushionstone. Sandstone sharpener. Chert microliths. Basalt beads, weights, maceheads, ringstones, hammers, saddle querns, mullers, pestles. Quartz microliths. Dolerite axes & celts. Diorite axe

(Chart 24 a Contd).

Raw Material	*Nasik*	*Jorwe*	*Kopargaon*	*Nevasa*	*Bahal*	*Inamgaon*	*Songaon*	*Chandoli*	*Dainabad*
		muller,		saddlequerns, weights	one. Ba-		mmerst- salt rubbers, querns, hammers, anvils, ringstones, sling balls		
Semi-Precious Stone	Chalcedony microliths including cores & flakes. Jasper microliths. Agate microliths. Carnelian microliths. Bloodstone microliths	Chalcedony microliths including cores & flakes, bead. Carnelian & Jasper microliths. Bloodstone flake	Chalcedony flakes	Chalcedony bead, micrroliths including flakes & cores. Amazonite beads. Charkonite dabber. Jasper & agate beads & microliths. Carnelian beads	Jasper Agate, Chalcedony microliths beads	Chalcedony drill, microliths including cores. Carnelian beads		Chalcedony microliths including flakes & cores. Jasper, Agate, Carnelian microliths	Chalcedony microliths, pebble hammers, sling balls, beads. Opal beads. Onyx beads. Jasper microliths, beads, pebble hammer. Agate microliths, beads, ithyphallus. Carnelian beads, microliths

Chart 24 b

MAHARASHTRA–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Prakash*	*Tuljapur Garhi*	*Bahu-rupa*	*Savalda*	*Pimplas*	*Satola*	*Koparli*	*Wala-dgaon*	*Pandari*	*Saste-vadi*	*Theur*	*Methi*	*Kurha-wada*	*Atud Khas*
Copper/ Bronze	fragment	ring, bangles, fishhooks, microbeads								fish-hooks	bangles			objects
Steatite	beads	bead												
Ivory	bangles, tusk													
Shell	bangles, beads								bead		beads			
Coral	beads													
Ordinary Stone	Rock crystal microliths. Dolerite pounders										Chert beads. Trap mullers, querns, pounders			
Semi-Precious Stone	Chalce-dony microli-ths inclu-ding fla-kes & cor-es. Jasper Agate, Ca-rnelian mi-croliths. Carneli-an beads	Chalce-dony micro-liths. Jasper, Agate & Carnelian beads. Agate micro-liths	Agate & Chalce-dony micro-liths	Chalce-dony blades	Chalc-edony micro-liths	Chalc-edony micro-liths	Chalce-dony micro-liths	Jasper & Cha-lcedony micro-liths		Chal-cedony blades.	Jasper, Agate beads	Agate & Chalce-ony micro-liths		Chal-ced-ony & Jas-per micro-liths

in various stages of manufacture and flakes—is found fairly uniformly. Chandoli has yielded a number of cores, including thirteen fluted cores and flakes (Deo and Ansari 1965:31). Daimabad provides striking evidence of the manufacture of microliths at the settlement in the form of a large percentage of debitage from the Savalda to the Jorwe phase including lumps, pieces, cores and nodules (Sali 1986:148–9). The raw materials exploited included chalcedony, chert, jasper, carnelian, basalt, agate and quartz. Furthermore, in Phase V in House 3 ('Lime Maker's House'), a flat ovalish stone of basalt and around it one fluted core, a few blades, and six waste flakes were found, indicating that microliths were being manufactured there (Sali 1986:137–8). Cores and flakes in chalcedony, crystal and agate were noted at Prakash (Thapar 1964–5:100). At Inamgaon, the chipped stone blade industry was apparently carried on in all individual households throughout the life of the site (Sankalia, et al. 1975:8). Cores and flakes in chalcedony and agate primarily but also sometimes in the other allied siliceous minerals such as jasper, for instance, have been noted at Tuljapur Garhi (*I.A.R.* 1984–5:50), Methi (*I.A.R.* 1980–1:40), Kholai (*I.A.R.* 1980–1:40), Dhasla (*I.A.R.* 1960–1:63), Bahurupa (*I.A.R.* 1959–60:37), Pimplas, Satola and Koparlia (*I.E. 1958–9:24*).

Other stone artefacts were also often manufactured locally. At Nevasa, polished stone axes were manufactured at certain 'workshops' and 'factories' (Sankalia et al. 1960:150–2). A representative example is Factory C which contained a coarse basalt anvil, a hammerstone with battering marks, a small celt in the initial stage of manufacture and other stray stones. Factory sites in Trench E and Trench Y with similar repertoires are also noteworthy. At Chandoli (Deo and Ansari 1965:31–2), the evidence for the local manufacture of polished dolerite stone tools is in the form of four incomplete pieces—two from the excavations and the remaining two from the surface. Four irregular lumps of dolerite were also found on the surface; from two of them, flakes had been removed. From Daimabad, in the Malwa level, a workshop for the manufacture of mullers is reported (Sali 1986:98); fourteen stone mullers and five broken stones which seem to have been the raw material for manufacturing mullers were recovered.

Stone (beads): At Nevasa (Sankalia et al. 1960:346), one half-perforated bead of amazonite may indicate local manufacture. Two houses ie., House 57 and House 64, have been characterized by Sali (1986:137–8) as beadmakers houses at Daimabad, which, however, have yielded only two unfinished beads, of shell and carnelian, respectively. Bead-making was undoubtedly undertaken at Inamgaon, where two objects which can be classified as bead drills, one in chalcedony and the other in chert, were recovered

(Ansari 1978–9:10). In this context, Ansari also mentioned that on the periphery of Mound V, a number of carnelian lumps, dressing flakes and chips, roughouts of beads and a few unbored beads constituted the evidence for local manufacture of beads. Additionally, Dhavalikar and Ansari (1988:150) noted that House 97, as suggested by the presence of bead polishers, may have belonged to a lapidary.

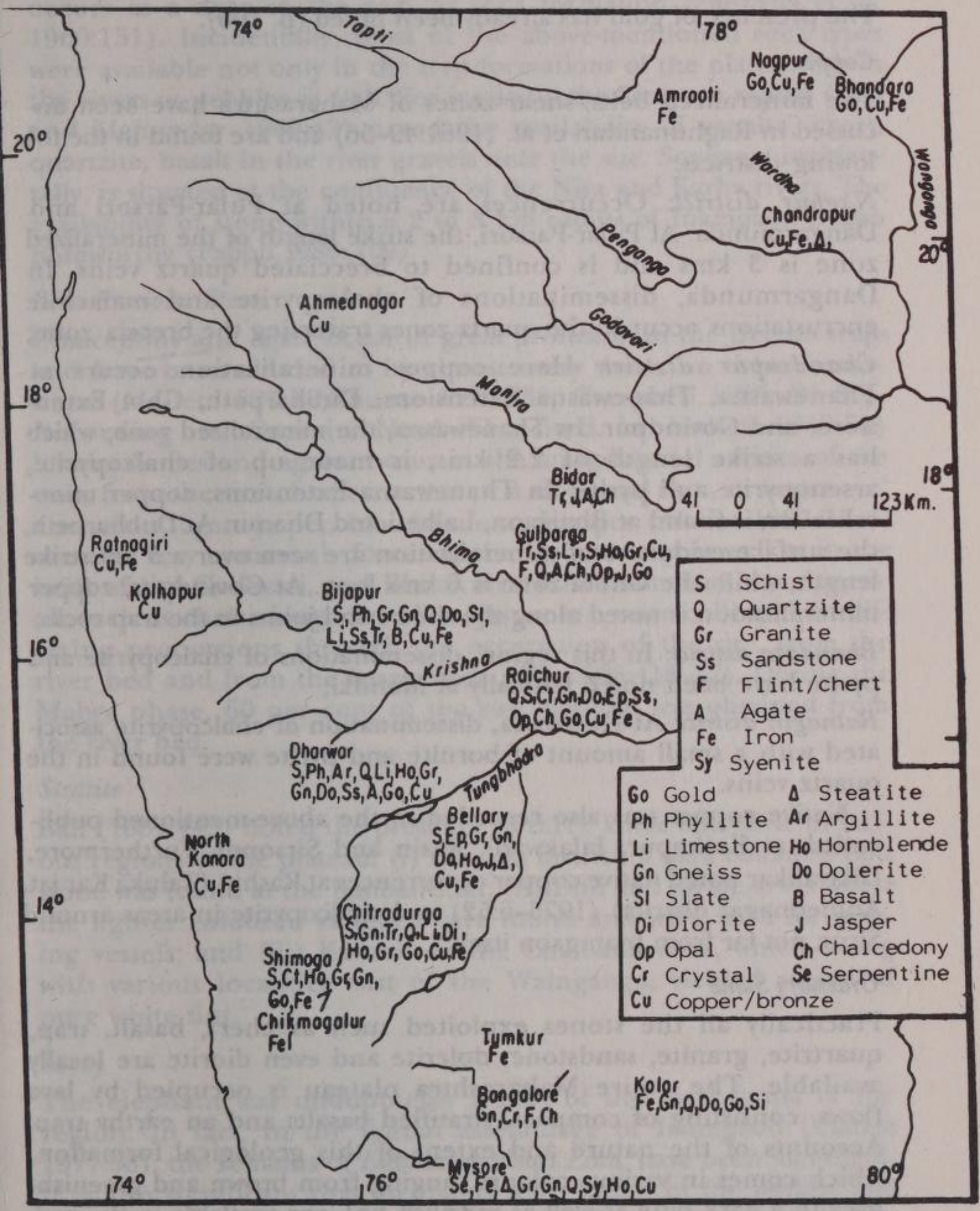
Shell: At Chandoli, a number of unfinished shell beads were found, along with the burnt debris of a wall which was, in the opinion of Deo and Ansari (1965:110), part of a structure where the beads were manufactured. The presence of an unfinished shell bead at Daimabad has already been noted above. In addition, in the Savalda phase of Daimabad, in the courtyard of house 12, a piece of a conch shell with a finely sawn surface and an ovaloid hole (from where a piece of that shape had been removed, probably for preparing a bead) was found (Sali 1986:570). At Inamgaon, the remains of conch shell columellae and finished bangles indicate the local manufacture of shell artefacts (Sankalia et al. 1975:10). It is also significant that the greatest quantity of shell came from a particular area—the westernmost area of Mound INM–1.

Ivory: The only evidence comes from Inamgaon where, in a house of the Malwa phase, a piece of elephant tusk was found (Dhavalikar 1975–6:52). It may be recalled that disc beads of ivory have been found at the site in all periods.

Copper/Bronze: The presence of local copper smelting is encountered only at Daimabad and Inamgaon. At Daimabad, Sali (1986:92) encountered in Phase I a small portion of a furnace which also yielded a piece of slag. According to Sali, the copper-smelting furnace referred to by Rao, in a previous excavation of the site, also belonged to the Daimabad cultural phase. Phase IV yielded in House 9 the remains of two furnaces, both of which contained ash, while one also yielded a heart-shaped razor of copper (Sali 1986:93); this house has been, therefore, referred to as the 'coppersmith's workshop'. What is called a 'craftsman's house' by Sali (1986:98) yielded a crucible suggesting that it was used by a metalcraftsman. Furthermore, slag has been encountered in the Harappan phase. At Inamgaon, the evidence consists of remains of a furnace in the middle levels of Period II and a lump of copper ore from the late levels of Period III (Dhavalikar 1975–6:52).

Gold: At Inamgaon, a small crucible and a pair of copper tongs have been interpreted as evidence for gold working at the site (Sankalia et al. 1975:10).

Map 19



RAW MATERIALS AVAILABLE IN MAHARASHTRA AND KARNATAKA

The Raw Materials Found within the Sub-Region

The presence of gold has already been noted (p. 108).

Copper

The mineralized belts/shear zones of Maharashtra have been discussed in Raghunandan et al. (1981:49–56) and are found in the following districts:

Nagpur district: Occurrences are noted at Pular-Parsori and Dangarmunda. At Pular-Parsori, the strike length of the mineralized zone is 3 kms and is confined to brecciated quartz veins. In Dangarmunda, disseminations of chalcopyrite and malachite encrustations occur in the quartz zones traversing the breccia zone;

Chandrapur district: Here copper mineralization occurs at Thanewasna, Thanewasna Extensions, Dubharpeth, Ghot Extensions, and Govindpur. In Thanewasna, the mineralized zone, which has a strike length of 2.2 kms, is made up of chalcopyrite, arsenopyrite and pyrite. In Thanewasna Extensions, copper mineralization is found at Bhajgaon, Lalheti and Dhanur. At Dubharpeth, the surface evidences of mineralization are seen over a 5 km strike length, while the Ghota zone is 6 kms long. At Govindpur, copper mineralization is noted along the shears and joints in the trap rocks;

Bhandara district: In this region, disseminations of chalcopyrite and pyrite have been noted basically at Mendki;

Ratnagiri district: At Hedavada, dissemination of chalcopyrite associated with a small amount of bornite and pyrite were found in the quartz veins.

Native copper was also recorded in the above-mentioned publication at Kolhapur, Jalakwadi, Rasin and Sirsondi. Furthermore, Dhavalikar noted native copper occurrences at Rashin (Taluka Karjat, Ahmednagar district) (1975–6:52) and chalcopyrite in areas around Sirur, not far from Inamgaon itself.

Ordinary Stone

Practically all the stones exploited such as chert, basalt, trap, quartzite, granite, sandstone, dolerite and even diorite are locally available. The entire Maharashtra plateau is occupied by lava flows, consisting of compact, stratified basalts and an earthy trap. Accounts of the nature and extent of this geological formation, which comes in various colours ranging from brown and greenish-grey to a dark blue as well as purplish tint, are available in the various district gazetteers (Campbell 1885:29; Campbell 1880a:16; Khunte 1976:22–3; Khunte 1974a:38, 1974b:38, 1974b:10–12, 1975:19). Quartz and quartzite occur throughout the trap. The inter-trappean beds in districts like Poona and Ahmednagar (Palande 1954:16;

Khunte 1976:23) also contain sandstone and limestone. Dolerite occurs as a dyke in the regular rock formation (Sankalia et al. 1960:151). Incidentally, most of the above-mentioned rock types were available not only in the trap formations of the plateau but in the rivers as pebbles as well. For instance, the Songaon report (Deo and Majumdar 1969:42) noted the availability of granite, chert, quartzite, basalt in the river gravels near the site. Songaon, incidentally, is situated at the confluence of the Nira and Karha rivers. The availability of stone within a 2 to 3 km radius of Inamgaon is also noteworthy (Pappu 1988: 109).

Semi-Precious Stone

Chalcedony and agate occur in great profusion in the Deccan traps and have been alluded to by almost every writer on these formations (Mallet 1887:70;Khunte 1974a:38; Campbell 1885: 29–30). According to Captain Newbold (cited in Mallet 1887:70) 'chalcedonies and agates occur in the amygdaloidal cavities of the trap, from the size of a pea to that of a six-pound shot, or larger . . .' Carnelian, agate-jasper, bloodstone and jasper (Mallet 1887:71–7) are also very commonly found in the Deccan trap as well as in the beds of the Godavari, and Bhima rivers. At Daimabad, raw materials such as chalcedony, carnelian, jasper etc. were collected, in differing proportions through the occupation of the site, from the river bed and from the basalt beds (Sali 1986:418–32). During the Malwa phase, 60 per cent of the raw material was obtained from the river bed.

Steatite

Ball (1881:443) noted the presence of three kinds of steatite in various regions of the plateau: (i) Chanda district: a dark coloured potstone was found at the Jambal Ghat; (ii) Dini and Biroli: areas where the lighter coloured varieties were found and were used for making vessels; and (iii) Kaneri: on the Chalband river, which, along with various localities east of the Wainganga, yielded schists of pure white tint.

Ivory

The elephant was undoubtedly a part of the local fauna of the region. In fact, in the faunal assemblage of Inamgaon (Badam 1977:58), the remains of *Elephas maximus Linn*, have been identified. It is also significant that elephants were found in the middle and late pleistocene deposits in central India (Sankalia et al. 1975:19). Furthermore, an almost complete elephant tusk was noted at Chandoli (Badam 1988:62).

The Raw Materials Available Outside the Region

GUJARAT

The presence of sea shells, including the conch shell which was widely exploited at Inamgaon, and amazonite has already been noted (pp. 79, 106).

Ceramic and Other Artefactual Links

In the cultural sequence of the Maharashtra plateau, two phases of inter-regional links can be outlined. In the first phase ie., from the Savalda culture till the late Harappan phase, unmistakable links with Gujarat and Saurashtra existed. In the subsequent Malwa and Jorwe phases, however, although Gujarat was not outside the purview of the region's focus, more significant links came to exist with Malwa and Karnataka.

A full-fledged late Harappan phase, undoubtedly receiving its stimulus from Gujarat, flourished at Daimabad and a few other sites of the region. The cultural repertoire of the phase, in addition to the various kinds of typical late Harappan pottery types, at Daimabad, also included evidence of Indus writing. Incidentally, the surface of this black and red ware resembled that of Rangpur IIc and III and some of the shapes, especially the chalice and carinated bowls were identical with those of the Lustrous Red Ware and the associated black-and-red ware of Saurashtra. Furthermore, at Theur in Pune district (*I.A.R.* 1969–70:28), Rao noted that the interior of certain pots were incised (before firing) with linear signs which had evolved from the Indus script. Typical late Harappan pottery ie., Rangpur IIB ware has also been found at Kaothe, Dhulia district, and three other small settlements in its vicinity—Kaothe II, Chhadwel and Surpan (Shinde 1985:173). At Sarangkheda (Dhule district) and at Fatyabad (Ahmednagar district) late Harappan ceramic elements have been found (*I.A.R.* 1978–9:16).

The other sites which have yielded Lustrous Red ware or wares with affinities to it are Prakash, Bahal and Chandoli. At Prakash (Thapar 1964–5:55), six sherds of this ware were found in Period I, associated with the black-painted red Jorwe Ware. At Bahal (*I.A.R.* 1956–7:17), in sub-period IB few sherds of a Lustrous Red slipped ware which recalled the post-Harappan red ware of Rangpur were noted. At Chandoli (Deo and Ansari 1965:53), in addition to Lustrous Red Ware of Rangpur affinity, a couple of sherds of what the excavators call a 'Rojadi like ware' have been noted—these sherds have a compact brownish core and a creamy pink slip on both surfaces.

The earliest evidence of contact with Malwa comes from Kaothe in Dhulia district where Kayatha ware has been found in

association with a pottery which shows unmistakable Harappan influence (*I.A.R.* 1984–5:53). At Daimabad, in the Daimabad cultural phase, among other features, the Black-Painted Red ware has parallels with Types T39A and T39ai of the Metallic Mat Painted ware of phase I at Navadatoli (Sali 1986:276). The most significant phase of interaction was the Malwa phase where a pottery which was unmistakably central Indian in origin came to dominate the cultural repertoire of various sites. Among the sites where there is evidence of the Malwa culture are Inamgaon, Songaon, (Deo and Ansari 1965:49), Prakash (Thapar 1964 & 65:35) and Walki (*I.A.R.* 1969–70:60).

Cultural affinities with Karnataka have been postulated on the basis of certain types of pottery and the morphology of stone axes. While the grey ware from Brahmagiri finds an echo in the Nevasa burial urns (Sankalia et al. 1960:24), at Bahal (Period I) (*I.A.R.* 1956–7:17) the shapes of a globular jar with a flared rim in a thick grey ware are supposed to be reminiscent of the Brahmagiri urn. The black-and-red ware of the late Jorwe phase at Inamgaon is believed, by the excavators (Sankalia et al. 1975:10), to have come from south India where it is characteristic of the Iron Age 'megalithic' complex in Andhra, Karnataka and Tamil Nadu. Polished stone axes at Nevasa bear a close resemblance to those from Brahmagiri and, on the basis of their morphology, have also been grouped into similar categories (Sankalia et al. 1960;24). Furthermore, a stone chisel at Nevasa is apparently identical in every respect with a specimen form Maski. The edge tools from Songaon (Deo and Majumdar 1965:42) belong to the pointed butt variety which is typical of the South Indian neolithic industry. From Chandoli, a stone chisel shows affinities with a chisel from Sangankallu, Bellary district (Deo and Ansari 1965:42).

Discussion

The Maharashtra Plateau had significant contact with central India from the late Harappan through the Malwa phase and, in fact, acted as a corridor along which resources from Gujarat and cultural elements percolated through to that region. With Gujarat also, Maharashtra shared an intimate relationship as manifested in the presence of late Harappan/Lustrous Red Ware at a number of sites in the sub-region stretching from Kaothe near the western coast to Tuljapur Garhi in the Amaravati district. By the Jorwe period, however, Maharashtra became more southward oriented with Jorwe ceramic elements found as far as Andhra Pradesh and southern Mysore.

The Andhra Plateau and the Andhra Coastal Plains

The Andhra plateau is divided physiographically into two regions, the ghats and the peneplains, the former being made up of a series of broken elongated hills along the eastern edge of the plateau, and the latter basically constituted of the Telangana and western Rayalseema region (Prasad and Singh 1987). This region is drained by mainly three river systems, the Godavari, the Krishna and the Pennar. Neolithic relics have been intermittently discovered here since the middle of the nineteenth century (Foote 1916). In the post-independence era, a number of surveys were made in this region (Allchin 1962; Sarma 1967; Rami Reddy 1976, 1978). Excavations have been carried out at Veerapuram (Sastri et al. 1984), Ramapuram (*I.A.R.* 1982–3:3–4; 1981–2:3) and Nagarjunakonda (Subrahamanyam 1975), among other sites. The group of sites identified by I.K. Sarma (1967) in the eastern part of the Kurnool district and the Cuddapah district with what is called 'Patpad ware' seems to belong to a different, and a slightly later, neolithic tradition. We have chosen to discuss this cluster of sites in this section as well primarily because it falls broadly within this region and also displays affinities with its cultural material. The succeeding chalcolithic phase is found at only a few sites such as Ramapuram, Veerapuram, Nagarjunakonda, Guntupalli etc.

The Sitewise Distribution of Raw Materials

Charts 25a–d comprehensively outline the raw materials used in this region for the production of diverse artefacts. These are steatite, shell, copper, chalcedony, carnelian, jasper, agate, opal, basalt, chert, sandstone, crystal, limestone, quartzite, granite, dolerite, diorite, pegmatite, epidote diorite, trap, schist, quartz, granodiorite, gneiss, haematite, and greenstone.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: That the neoliths of the ground and pecked stone industry were being manufactured almost always at the sites themselves is reasonably certain. In the Srikakulam region, sites like Bucchimpeta, Kpparavalasa, Ravivalas, and many sites around Kopparavalasa have yielded fluted cores and flakes made on chert and quartz (*I.A.R.* 1983–4:6). Ramapuram in Kurnool district also revealed, in addition to a number of fluted cores and flakes in chert and quartz, a 50 metre area in Phase A where the presence of large numbers of finished and unfinished microlithic tools, flakes and cores, along with a stone hammer and a fabricator-like stone

Chart 25 a

ANDHRA PRADESH—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Nagarjunakonda*	*Chinna-manur*	*Hulli Kallu*	*Gantu Palli*	*Tadpatri*	*Boggula Gonde*	*Buddagavi Hill*	*Chetna Palli*	*Buthamahal Hill*	*Chinnadan-dukonda*
Steatite	beads	beads		bead		beads				
Shell	beads, pieces	bangles								
Copper/ Bronze	fragments	rings, bangles		celt						
Semi-Precious Stone	Chalcedony cores, flakes, blades, point, scrapers. Carnelian cores, flakes, blade, point. Agate cores, point, blade, Jasper beads, flake	Agate beads, Jasper beads. Carnelian beads	Chalcedony blades & cores		Jasper cores & blades	Chalcedony microliths. Jasper microliths	Chalcedony microliths	Chalcedony microliths. Agamicroliths. Carnelian microliths	Chalcedony microliths	Chalcedony microliths, Agate microliths
Ordinary Stone	Basalt flakes, blades, balls, hone. Chert microliths including cores, flakes. Sandstone pestles, indeterminate object. Crystal microliths. Quartzite flakes, neoliths, nodules, pestles. Granite anvil. Dolerite, Diorite neoliths. Dolertie microlithic flakes	Dolerite axes, chisels, adzes. Crystal beads	Chert microl iths. Granodiorite, Dolerite, Granite, Pegmatite & Epidote neoliths		Chert cores & blades. Crystal cores & blades	Chert microliths	Dolerite, Epidiorite, Granite, Granodiorite, Diorite, Pegmatite, Quartz neoliths. Chert microliths	Dolerite and Granite neoliths. Chert, Quartz, Crystal, Haematite microliths	Dolerite, Epidote Granite, Granodiorite neoliths. Granodiorite, Diorite ringstones. Chert & Quartz microliths	Dolerite, Epidote granite, Sandstone neoliths. Sandstone scraper. Chert, Quartz microliths

Chart 25 b

ANDHRA PRADESH—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Pillalapalli*	*Ramapuram*	*Konda Bucchimpeta*	*Banjaripeta*	*Gandhuru*	*Veerapuram*	*Pusalapadu*	*Donekal North-East*
Steatite		beads			beads	beads	beads	
Shell		beads						
Copper/ Bronze		parer, rods, wires, needles, beads, bowl fragments, armlets			axe, wire	axe like object, pieces		
Ordinary Stone	Dolerite Granite neoliths. Dolerite piece. Granite quern. Chert microliths	Chert, Quartz microliths. Trap & Quartzite maceheads, celts	Chert blades & flakes			Dolerite & Basalt ground stone tools, including axes, adzes, chisels, choppers, scrapers, hammer. Limestone celt. Sandstone querns, rubbers, mullers, palette, ringstones. Granite querns, rubbers, mullers, palettes, hammers. Quartz rubbers. Quartzite hammers, microlihs. Chert microliths including scrapers, cores, blades. Crystal microliths	Dolerite axe. Sandstone macehead	Dolerite, Epidote, Granite, Granodiorite, Greenstone neoliths. Chert microliths
Semi-Precious Stone		Chalcedony beads, microliths, Jasper microliths. Carnelian beads		Carnelian beads		Chalcedony, Agate, Carnelian, Opal microliths		Jasper cores

Chart 25 c

ANDHRA PRADESH–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Godekal West*	*Godekal North-West*	*Gulapalayam*	*Havalgi*	*Karakumukkala*	*Lattavaram Hill*	*Malapuram*	*Mallappakonda*	*Mudigal*	*Peddadandukonda*
Semi-Precious Stone				Chalcedony, Jasper, Carnelian microliths	Chalcedony & Agate microliths	Chalcedony, Agate, Jasper microliths	Chalcedony microliths		Chalcedony microliths	Chalcedony, Jasper, Agate, microliths
Ordinary Stone	Dolerite, Epdotegranite, Granodiorite neoliths. Chert microliths	Dolerite, Epidote, Granite, neoliths. Chert microliths	Dolerite, Epidote Granite, Granodiorite, Diorite, Greenstone microliths	Dolerite, Epidote Granite Diorite, neoliths. Dolerite scraper. Chert microliths	Dolerite, Epidote Granite, Granodiorite, Diorite neoliths. Chert microliths	Dolerite, Epidote granite, Granodiorite, Greenstone, Pegmatite neoliths. Granite, Granodiorite, Dolerite, Diorite ring stones. Dolerite scraper. Chert microliths	Dolerite, Epidote granite, Granite, Granodiorite, Diorite, Greenstone & Quartz neoliths, Chert microliths	Dolerite, Epidote granite, Quartz neoliths	Dolerite, Epidote Granite, Granodiorite, Greenstone and Granite gneiss neoliths. Granite, Granodiorite, Gneiss ring stones. Chert microliths	Dolerite, Epidote Granite, Granite, Diorite neoliths. Chert & Quartz microliths

Chart 25 d

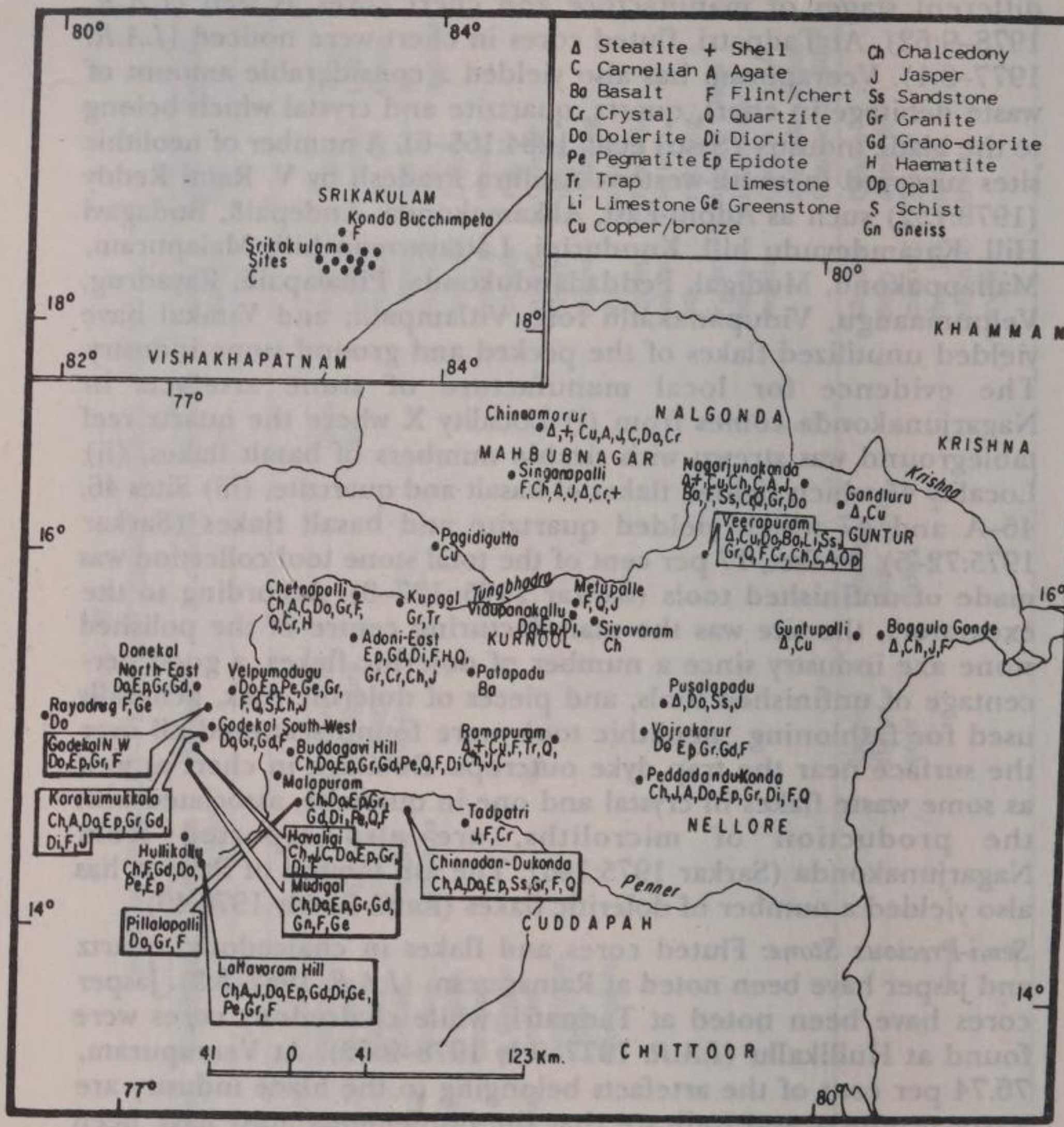
ANDHRA PRADESH–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Rayadrug*	*Urvakonda*	*Vajrakarur*	*Vidupanakallu West*	*Metupalle*	*Sivavaram*	*Patapadu*	*Velpumadugu*	*Adoni-East*	*Kupgal*	*Singinapalli*
Shell											beads
Steatite											bead, bangle
Ordinary Stone	Dolerite tools	Dolerite, Epidote granite, Granodiorite, Pegmatite neoliths. Chert microliths	Dolerite, Epidote-granite, Diorite, Granite neoliths. Granite & Granodiorite ringstone. Chert microliths	Dolerite, Epidote granite, Diorite neoliths	Chert Cores, flakes. Quartz cores		Basalt axe	Dolerite, Epidote granite Pegmatite, Greenstone neoliths. Granite quern. Chert microliths. Quartz microlith. Schist maceheads	Epidote granite, Granodiorite, Diorite neoliths. Granite quern, rubbing stone. Granodiorite rubbing stones. Chert Haemetite, Quartz & Crystal microliths. Granite neoliths	Trap celts, Granite querns	Chert microliths. Crystal bead
Semi-Precious Stone					Jasper flakes, core	Chalcedony cores, flakes		Chalcedony microliths. Jasper microliths	Chalcedony & Jasper microliths		Chalcedony Agate microliths. Jasper axe

object, suggest that it was a tool manufacturing area (*I.A.R.* 1982–3:3). Hullikallu has yielded a large number of polished stone tools in different stages of manufacture and chert cores as well (*I.A.R.* 1978–9:62). At Tadpatri, fluted cores in chert were noticed (*I.A.R.* 1977–8:1). Veerapuram has also yielded a considerable amount of waste debitage in chert, quartz, quartzite and crystal which belong to the blade industry (Sastri et al. 1984:165–6). A number of neolithic sites surveyed in south-western Andhra Pradesh by V. Rami Reddy (1978:132) such as Adoni-East, Akkamakonda, Andepalli, Budagavi Hill, Katamdevudu hill, Kunduripi, Lattavarman hill, Malapuram, Mallappakond, Mudigal, Peddadandukonda, Pillalapalli, Rayadrug, Velpumaaugu, Vidupanakallu fort, Vitlampalli, and Yatakal have yielded unutilized flakes of the pecked and ground stone industry. The evidence for local manufacture of stone artefacts in Nagarjunakonda comes from (i) Locality X where the quartz reef tableground was strewn with sizable numbers of basalt flakes, (ii) Locality 45 which yielded flakes of basalt and quartzite, (iii) Sites 46, 46–A and 47 which yielded quartzite and basalt flakes (Sarkar 1975:72–5). In fact, 17 per cent of the total stone tool collection was made of unfinished tools (Sarkar 1975:;127–8). According to the excavators, the site was the manufacturing centre of the polished stone axe industry since a number of doleritic flakes, a good percentage of unfinished tools, and pieces of doleritic rock, generally used for fashioning neolithic tools were found scattered all over the surface near the trap dyke outcrops. Debitage in chert as well as some waste flakes in crystal and one in quartzite, associated with the production of microliths, are also reported from Nagarjunakonda (Sarkar 1975:140). The ash mound of Palavoy has also yielded a number of doleritic flakes (Rami Reddy 1976:40).

Semi-Precious Stone: Fluted cores and flakes in chalcedony, quartz and jasper have been noted at Ramapuram (*I.A.R.* 1982–3:3). Jasper cores have been noted at Tadpatri, while chalcedony cores were found at Hullikallu (*I.A.R.* 1977–8:1; 1978–9:62). At Veerapuram, 76.74 per cent of the artefacts belonging to the blade industry are waste products and indicate that the implements must have been prepared in the habitation itself; the raw materials used are carnelian, chalcedony, agate and opal (Sastri et al. 1984:165–6). Also in the neolithic sites surveyed in south-western Andhra Pradesh, waste products ie., worked pieces, flake cores, blade cores, unfinished blades, flakes and chips belonging to the blade industry, were found (Rami Reddy 1978:85); such waste material, although the specific raw material is not mentioned, was probably in chalcedony, jasper, agate and carnelian since microliths in these materials are reported from the various sites. At Nagarjunakonda, from Site 45 have been recovered waste flakes, cores, and core

Map 20



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT -SITEWISE DISTRIBUTION OF RAW MATERIALS IN ANDHRA PRADESH

trimming flakes in carnelian, agate and chalcedony, as well as one flake in jasper (Sarkar 1975:140).

Steatite: According to Sarma (1967:88–9), at Pusalpadu, the enormous quantities of whitish discular steatite beads suggest a factory site there. Ramapuram also seems to have been a production site for steatite beads (Sarma 1967:89).

Shell: A conch shell piece was found in Pit 28, as well as fragments and one whole mussel shell in Pits IB and 6 of Site 46–A at Nagarjunakonda (Sarkar 1975:162).

Copper/Bronze: Lumps of copper were found at Ramapuram (Phase B) (*I.A.R.* 1983–4:4).

The Raw Materials Found within the Sub-Region

Steatite

That steatite is locally available in a number of localities is evident even from a reading of some of the basic archaeological reports (Sastri et al. 1984:5: Rami Reddy 1978:7,8). A comprehensive account of the steatite deposits of the state is found in the Geological Survey of India publication (Karunakaran: 1975:43–4) from which the following summary of the basic deposits has been compiled:

Anantapur district: Good quality steatite is found at Jangamreddipalle, Madugupalle, Karrnapudi, Mutsukota and Tabjula;

Chittoor district: Steatite occurs near Pathur and Gangadharnallur. Impure types are found at Kottampalli, Vezupalli, Pathagunta and Palal;

Cuddapah district: A poor quality is noticed near Israjpalli, Lachimidevipalle, Potaram and Kondapuram;

Khammam district: Low-grade steatite is found at Jestaipalle, Sudimella and Singareni;

Kurnool district: Minor occurrences of steatite can be seen near Chandrapalle, Marrikunta, Yaparlapadu and Gadidemadugu;

Mahbubnagar district: Poor quality steatite occurs at a few places between Somsil and Kollapur, and near Amargiri;

Medak and Nizamabad districts: Small occurrences are present in Choutpalli, Nizamabad district and at Gunpur and Rajagopalpet in Medak district.

Copper

The areas which contain copper would be clear from a reading of Chart 26, which is based on a number of Geological Survey of India publications (Satyanarayana Rao 1972; Karunakaran 1975: 21–3;

Chart 26

COPPER OCCURRENCES OF ANDHRA PRADESH

Sr.No.	*Area*	*Sub-Region*	*Old Workings*
1)	Cuddapah District	Velidendla, Chinnakudala, Bestavaripalle, Brahmanapalle, Venkatapuram, Vemula, Midipenta	
2)	Guntur District	Bandalamottu block, Nallakonda block, Dhukonda block	ancient workings around the villages of Agnigundala, Ipuru, Vudujerala, Malapadu & Yamagiripaya
3)	Khamman District	Mailaram area, Venkatapuram, Banjar, Mainkawaram, Rabingudem, Sarkal, Yellamballu	
4)	Kurnool District	Kommamarri, Somyazullapalle, Gani area, Jonnagiri area	old workings at Gani, Bastipadu, Gummamanikonda, and Jonnagiri
5)	Nellore District	Chandrareddipalem, Gotigundla, Garimanipenta, Gogupalle, Kottapeta, Rajupalem, Somalregada, Tirumalapuram, Vinjamoor	
6)	Prakasan District	Gajjalakonda area	old workings at Gajjalakonda, Itemkuvva, Yummidivaram, Kunchugavi
7)	Mahbubnagar District	Ramasamudram, Karnikalwal tract in Makthal taluk	old workings at a few places in Makthal taluk
8)	Nalgonda District	Chintriyal	old workings at Chintriyal

Sivadas et al. 1985). The copper occurrences in the Mahbubnagar and Nalgonda districts are noted in the relevant district gazetteers (Rajagopal 1976a:9; Rajagopal 1978:13).

A number of old workings are found in the Kurnool, Guntur, Mahbubnagar and Prakasam districts. In the Kurnool region, these include workings at irregular intervals in an area stretching over 16 km in the Gani-Kalava valley, shallow pits near Kalava, Gani, Chennakkapalle, and Brahmanapalle (Satyanarayana Rao 1972:26–27). In the Guntur district, the ancient workings of copper around Agnigundala have been referred to since the beginning of the nineteenth century (Heyne 1814, cited in Sivadas et al. 1985:1). Huge slag heaps around the villages of Agnigundala, Ipuru, Vadujerala, Malapadu and Yamagiripaya and in some places broken earthen

tubes, believed to be broken crucibles for smelting the ore, were also noted. Ancient workings for copper are found at a few places in the Makthal taluk in Mahbubnagar district (Rajagopal 1976a:9).

Ordinary and Semi-Precious Stone

Practically the entire repertoire of ordinary stones used for the manufacture of artefacts by the sites of this zone were available within the ambit of the region itself. The district-wise distribution is as follows:

Anantapur district: The representative rock types of this area include dolerite, schist, quartzite, hornblende schist, amphibolite, metagabbro, and granite gneiss (Rami Reddy 1978:7).

Kurnool district: In the west, a major portion of which is made up of Archaean rocks, there are a number of outcrops of granite, gneiss, quartz, hornblende, schist, quartzite and pegmatites (Rajagopal 1974:9). In the eastern half of the district, the rocks of the Cuddapah system are exposed and include dolomites, quartzite and sandstone (Rajagopal 1974:9). These rock types are also found in the Kurnool system which, in addition, yields pebbles of chert and quartz (Rajagopal 1974:12). In the conglomerates there are rounded pebbles of quartz, jasper, chert, some haematite and chalcedonic silica (Rajagopal 1974:9). Also, basalt, dolerite and gabbro are found here (Rajagopal 1974:11).

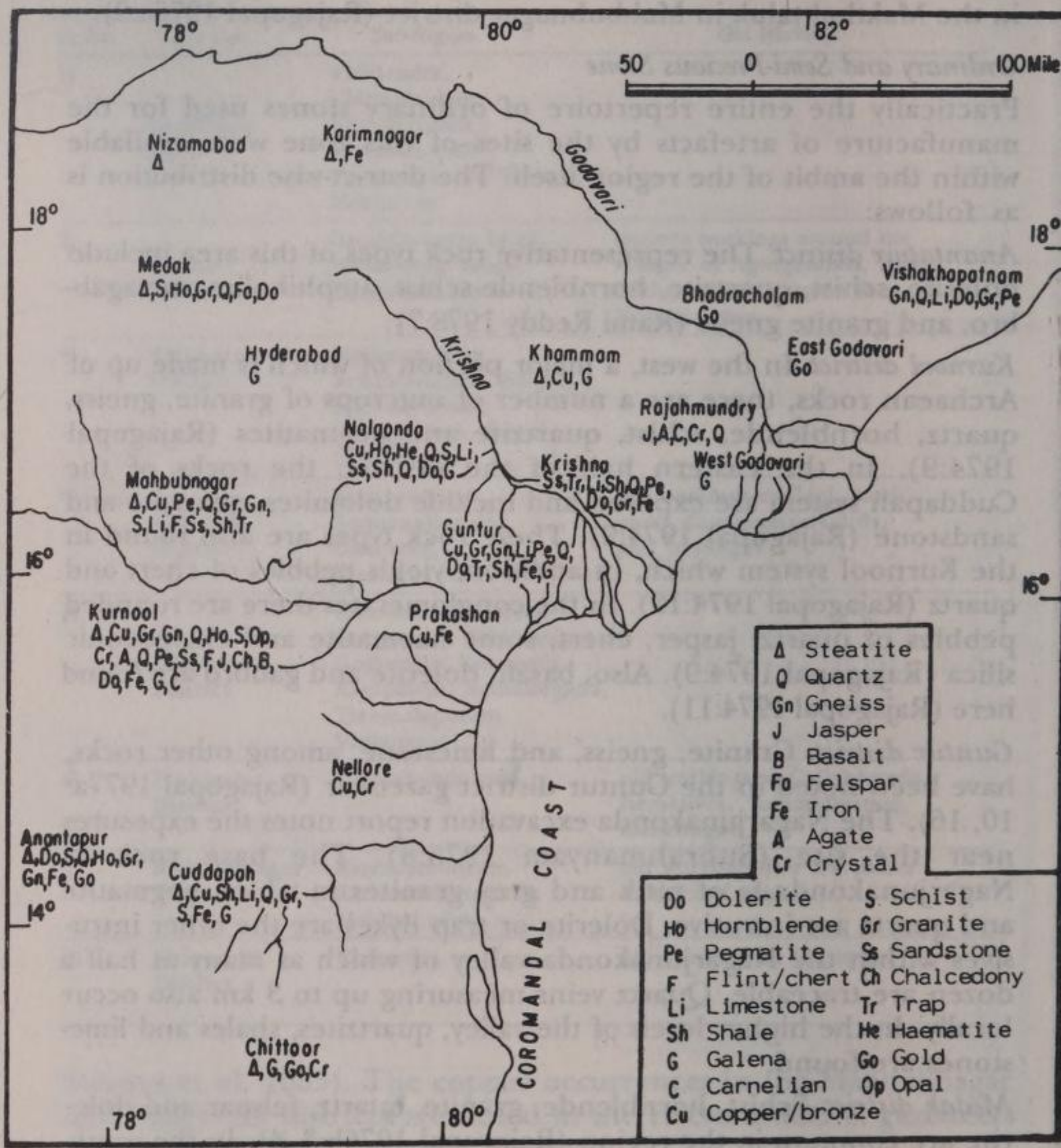
Guntur district: Granite, gneiss, and limestone, among other rocks, have been noted in the Guntur district gazetteer (Rajagopal 1977a: 10, 16). The Nagarjunakonda excavation report notes the exposures near the site (Subrahmanyam 1975:8). The base rock of Nagarjunakonda is of pink and grey granites in which pegmatite and quartz are intrusive. Dolerite or trap dykes are the other intrusives within the Nagarjunakonda valley of which as many as half a dozen are traceable. Quartz veins measuring up to 3 km also occur locally. In the higher levels of the valley, quartzites, shales and limestones are found.

Medak district: Schist, hornblende, granite, quartz, felspar and dolerite are common in the region (Rajagopal 1976b:3–4). In the southwestern part of the district, at some places, chalcedony, agate, jasper and plasma occur.

Krishna district: In the various geological formations of the region sandstones, trap dykes, limestones, shales, quartzites, pegmatite, dolerite and granite are found (Rajagopal 1977b:6).

Nalgonda district: Hornblende schists, haematite, quartzites, schists, limestones, sandstone, shales, and dolerite dykes are found in this district (Rajagopal 1978:4).

Map 21



RAW MATERIALS AVAILABLE IN ANDHRA PRADESH

Vishakapatnam district: In this district, gneiss, quartzite, limestone, dolerite, granite and pegmatite are found (Ramesan 1979:5).

Mahbubnagar district: The geological formations of this district include dyke, pegmatite, quartz, granite, gneiss, schist, limestone, chert, sandstone, shale, and Deccan trap (Rajagopal 1976a:5).

Cuddapah district: In this district, shale, limestone, quartz reef, granite and schist are found (Sankaranarayana 1967:22).

Shell

Conch shell, fragments of which are found at Nagarjunakonda in the Guntur district, was probably procured from the Andhra Pradesh coastline (cf. Kenoyer 1985:301).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

Ceramic and Other Artefactual Links

The significant linkages of this sub-region are with the adjoining Raichur and Bellary districts of Karnataka. We have chosen not to discuss these in any detail since they are, in a sense, not relevant in working out the major interregional trade routes in this region. However, ceramic links with Chandoli and Navdatoli as well as with Gujarat have been suggested.

There is a cluster of sites in the Kurnool district such as Patapadu and Pusalapadu, among others, which have revealed clear stylistic ceramic links with the Malwa levels of Chandoli and Navdatoli (Sarma 1967:83). I.K. Sarma noted affinities between a number of Pusalapadu ceramic wares and Malwa types: (i) In the painted black-on-red ware a fragment of a deep convex sided bowl with short painted strokes followed by a horizontal rim band and a diamond pattern is found at Navdatoli and Chandoli. Another fragment of a rimless bowl with flaring convex sides, painted on the exterior in light black, short, vertical strokes is similar to examples from Chandoli (Malwa) ware specimens; (ii) The Black and Red/Black-and-Grey ware is found at Navdatoli (III and IV) to a limited extent, and at Chandoli in the chalcolithic levels; (iii) In the Burnished Grey ware, the fragment of a lipped bowl seems to be of a type noted at Navdatoli in the painted black-on-red ware. However, this type is seen in a number of sites in the southern neolithic zone also; (iv) The plain coarse Red and Brown ware has all the characteristics of the Malwa ware, and is found at Navdatoli (III), as well as at Chandoli where even a channelled bowl with a 'V' shaped short lip was found. At Patapadu, the painted lipped bowls

are also apparently similar to those from Navdatoli (Allchin 1962:222). The lipped bowl is also found at Nagarjunakonda (Sarkar 1975:120). However, since these types are found at sites like Brahmagiri, Sanganakallu and Piklihal, the above-mentioned 'analogies' may not be particular useful.

Sanganapalli in Kurnool district, according to Rao (*I.A.R.* 1967–8:3), its excavator, adopted the painted pottery tradition of the post-Harappan chalcolithic cultures of western India. Among the similarities that he has highlighted (cf. the shapes of some jars and dishes, the presence of perforated ware etc.) the most significant seems to be the presence of Lustrous Red Ware.

Discussion

The neolithic cultures and the subsequent chalcolithic phase of the Andhra plateau seem to have been basically a regional phenomenon which, while being involved in the production of artefacts from a diverse number of raw materials, used locally available resources, whether it was steatite, copper or the various kinds of rock types. Significant artefactual linkages with Chandoli and Navdatoli existed. Although Rao has suggested similarities between the Harappan and late Harappan levels of Gujarat and Singanapalli, it may be mentioned that most of these similarities are too general to be of specific relevance for outlining interaction zones. For instance, one feature mentioned by Rao in this context ie., the presence of steatite beads, is a common element in many neolithic-chalcolithic sites of the Andhra plateau with possible factory sites for their production at Ramapuram and Pusalapadu. From this point of view, the only significant non-local artefactual element is Lustrous Red Ware.

North Karnataka Plateau and the Malnad Region

The Karnataka region has been described as 'a table land, situated in the angle where the Eastern and Western Ghat ranges converge into the group of the Nilgiri hills'. (Hayavadana Rao 1927:1). The north Karnataka plateau is the northern section of the *Maidan*, literally open country, so named because of its relatively low and subdued relief (Singh et al. 1987:814). This region seems to have been culturally different from its southern counterpart, and geographically also, for the latter is drained by the Kaveri system, north *Maidan* is dependent on the Krishna river system. The general surface of this tableland looks like a level plain with Bruce Foote's 'castellated hills' rising here and there, about 800 to 900 feet above the plain level. The Malnad region, 'the hill country, lies to the west and is confined to the tracts bordering or resting on the Western

Ghats. It is a land of magnificent hill and forest, presenting alterations of the most diversified and charming scenery' (Hayavadana Rao 1927:4). The narrow low strip which borders it includes the region of north Kanara. The noteworthy excavations include those at Tekkalakota (Nagaraja Rao and Malhotra 1965), Hallur (Nagaraja Rao 1971), Sanganakallu (Subba Rao 1948; Ansari and Nagaraja Rao 1969), Piklihal (Allchin 1960), Utnur (Allchin 1961), Kupgal (Majumdar and Rajaguru 1966), Maski (Thapar 1957), Brahmagiri (Wheeler 1947–48) and Kodekal (Paddayya 1973). A number of explorations have also been conducted and on the whole, the stratigraphy and cultural repertoire of the region are fairly well understood (for radio-carbon dates see Paddayya 1971).

The Sitewise Distribution of Raw Materials

Chart 27a–e give a reasonable picture of the resources that were exploited in this sub-region. Briefly, these resources are steatite, shell, coral, copper/bronze, gold, schist, dolerite, epidiorite, gneiss, diorite, epidosite, sandstone, hornblende, granite, quartzite, chert, quartz, limestone, argillite, basalt, syenite, pistacite, ironstone, crystal, trap, flint, carnelian, amethyst, chalcedony, opal, jasper, and agate.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Stone tools, both of the ground and pecked variety and microliths, were manufactured at Hallur, Tekkalakota, Piklihal, Hegragi, Utnur, Kodekal and a number of other sites in the Shorapur doab, including Sanganakallu, Brahmagiri, Maski, and Hutakundi. Flakes and cores in quartzite and one flake in milky quartz are reported from Hallur (I and III) (Nagaraja Rao 1971:85–8). At Tekkalakota, the occurrence of tools of the ground and pecked industry in all stages of manufacture and the presence of grinding grooves on a number of natural boulders show that the tools were locally produced (Nagaraja Rao and Malhotra 1965:55). That ground stone axes were locally manufactured at Piklihal, according to Allchin (1960:87), is evident from the fact that, out of more than 100 specimens, only one out of every ten is approximately complete. Some of the above-mentioned specimens may have been broken fragments, but at least 14 were rough blocks intended for axe manufacture. Various by-product flakes in basalt were also noted in the surface collection from Piklihal (Allchin 1960:87). Also, all over the site, and in all the excavated areas as well, blades, flakes and cores were found in large numbers with 2.35 per cent of the total collection being cores (Allchin

Chart 27 a

NORTH KARNATAKA–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Halkur*	*Tekkalakota*	*Piklihal*	*Utnur*	*Sanganakallu*	*Brahmagiri*	*Maski*
Steatite	beads	beads	bead		beads	button	
Shell	beads, pendants	beads, pieces	beads		beads, pendant		beads
Coral							beads
Copper/ Bronze	axes, fish-hook	axe, spiral, wire, ring, nail-head, piece	chisel, bowl fragments			chisel, rods, ring	rod
Gold		pendants					
Ordinary Stone	Schist chips, chisels. Dolerite discs, chisels, axes, wedges. Epidiorite wedge. Granite rubbers, quern. Quartzite hammer, cores, blades, triangles, points, lunates. Chert lunate. Quartz flakes, cores, blades, scrapers, points, lunates, bead	Granite boulders, non-edge tools including hammers, anvils Epidiorite edge tools, rubbers, hammer. Schist edge tools. Dolerite edge tools, adze. Chert blade industry including flakes, scrapers, cores, blades, points, lunates, triangle, trapeze. Lim-	Basalt axes, scrapers, flakes, chisels, borers, hammers. Granite axes, rubbers, querns, pallettes, grinding stones, flake, hammers, pestle. Dolerite axes, rubbers, hammers. Diorite axes, rubbers. Quartz rubber, microliths. Quartzite palettes. Syenite dabber, hammer.	Chert blades, flakes, fragments, cores, lunate. Crystal core, discoid. Gneiss axes, flakes, blocked out axes, discoid, rubbers, hammers. Hornblende axes, blocked out axes, rubbers, palettes, quern. Basalt axes, flakes, blocked	Basalt axes. Trap flakes. Sandstone flakes. Quartz flakes, microliths. Chert microliths including lunates, blades, flakes. Granite slingstones, rubbers, grinders	Trap axes. cores, flakes. Flint microliths. Crystal microliths including blades. Granite querns, balls	Dolerite axes. Granite hammerstones, balls. Chert microliths including cores, nodules, flakes, blades, points, trapezes, lunates, burin

(*Chart 27 A Contd*)

Raw Material	*Hallur*	*Tekkalakota*	*Piklihal*	*Utnur*	*Sangankallu*	*Brahmagiri*	*Maski*
		estone bead. Argillite bead	Pistacite rubbers. Chert blade industry including cores	out axes. Granite axes, rubbers, pestle, querns, palettes, hammers. Dolerite axe, flakes, rubbers, spheroid, hammers, palettes. Diorite axe, rubbers, hammer. Ironstone rubber. Quartz hammerstone			
Semi-Precious Stone		Carnelian bead	Chalcedony microliths. Opal microliths. Carnelian bead	Chalcedony flake, core, discoid. Jasper core	Jasper microliths including blades, lunates, flake. Agate flakes. Chalcedony flake. Carnelian beads	Agate microliths. Jasper microliths. Opal microliths. Carnelian blades, gravers	Agate microliths, bead, nodules. Carnelian microliths, beads. Opal microliths. Chalcedony microliths, nodules & beads. Amethyst bead

Chart 27 b

NORTH KARNATAKA—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Budihal*	*Malkur–1*	*Kodekal*	*Budihal–S*	*Tirth*	*Kakkera–1*	*Kannekolur–1*	*Kannekolur–2*	*Bijaspur*
Steatite			bead						
Ordinary* Stone	Granite quern. Chert cores	Granite querns. Chert blades, scrapers, points, scraper-cum points, scraper-cum-borers	Granite quern, cone. Chert microliths including blades, lunates, cores, borers. Limestone microliths, pebble. Quartz microliths. Sandstone piece	Chert blades, scrapers, points, borers, scraper-cum-borers, burins, trapeezes, arrowheads	Chert blades, core flake tools, points	Chert artefacts. Dolerite artefacts	Chert blades, scrapers, lunates, cores	Chert core flake tools, lunates	Chert points
Semi-Precious Stone			Chalcedony microliths. Agate microlith			Chalcedony Agate & Jasper microliths	Chalcedony borers & other artefacts. Agate and Jasper artefacts	Agate beads & artefacts. Chalcedony & Jasper artefacts	

* A significant pecked and ground stone industry is present in the Shorapur doab which includes dolerite axes, adzes, chisels, wedges, chopping tools, hammerstones, rubberstones, pointed tools and flake blades; Chert chopping tools, hammerstones; Granite hammerstones, rubberstones; Veined rock hammerstones; Quartz hammerstones; Sandstone hammerstones, rubberstones; Limestone hammerstones, rubberstones, flake blade; Epidosite hammerstones; Gneiss hammerstone; Schist hammerstone. However, the distribution of the above-mentioned artefacts at the individual sites is not mentioned by Paddayya.

Chart 27 c

NORTH KARNATAKA—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Yerhanhal*	*Birnur*	*Benkanpalli*	*Shakapur*	*Tadbid*	*Budnal*	*Wadgiri*	*Kupi*	*Sitimani*
Ordinary Stone	Chert flakes. Dolerite flakes							Chert trapezes	Trap axe
Semi-Precious Stone	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts	Agate, Chalcedony & Jasper artefacts		

* The note on the previous page is also relevant for these sites

Chart 27 d

NORTH KARNATAKA—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Mudenur III*	*Nadihara-Lahalli*	*Hadaragen*	*Fatehpur*	*Mannur*	*Menasgi*	*Nidagundi*	*Savadi*	*Nidagundikop*	*Urchan*
Copper/ Bronze										bead
Ordinary Stone	Trap neolith	Trap celts	Trap axes	Trap axe	Chert blades	Chert blades	Chert blades	Chert blades	Chert blades	
Semi-Precious Stone	Chalcedony core			Chalcedony core						Jasper blade. Chalcedony blades, cores

Chart 27 e

NORTH KARNATAKA–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Kallur*	*Kirthur*	*Maradigi*	*Guddey Mardi*
Ordinary Stone	Chert blades	Chert blades	Chert blades	
Semi-Precious Stone				Chalcedony core

1960:95). Hegragi seems to have been a factory site as it has yielded a large collection of waste material such as cores and partly prepared cores of chert (Allchin 1960:96). At Utnur, microliths were apparently produced at the site itself since it has yielded chert flakes, fragments and cores (Allchin 1961:43). That the larger neoliths were also produced there is evident from the fact that waste flakes in gneiss, basalt and dolerite were noted as well as eleven blocks, very roughly flaked, of basalt, hornblende schist and gneiss which were intended to be axes (Allchin 1961:48–9). The presence of workshops at several doleritic outcrops in the Shorapur doab was apparently mentioned by C. Mahadevan but Paddayya (1973:31), who conducted a major exploration in this region, could not locate them. Still, on the basis of the occurrence of specimens representing different stages of manufacture at sites like Budihal there, Paddayya surmised that local working was sometimes carried out at the sites themselves (Paddayya 1973:31). The surfaces of a number of sites in the Shorapur doab also yielded a large amount of waste material associated with the neolithic blade industry, of which Mallur-1, Tirth, Budihal-S, and Kodekal rank as the most extensive (Paddayya 1973:42). For instance, Kodekal yielded 29.21 per cent of waste debitage which strongly suggests that the artefacts were manufactured at the site itself (Paddayya 1973:68). Sanganakallu, in the opinion of Subbarao (1948:5), was a huge factory site where neolithic implements and axes were made. Phase II of Sanganakallu, which was the most flourishing stage of the 'factory' yielded a large number of rejected chips (at least 1481 trap flakes) and axes in various stages of manufacture (Subbarao 1948:22). A large number of short blade cores associated with microlithic manufacture, in chert and quartz, were also found on the surface of the site (Subbarao 1948:23). At Brahmagiri, according to Wheeler (1947–8:248), the polished trap axes were produced at the site itself. At Maski, nodules of chert and chert flakes have been found suggesting local production of microliths (Thapar 1957:89, 94). The neolithic site of Hulakundi has also yielded an incompletely worked crude axe and a few half-worked stone implements (*I.A.R.* 1959–60:72).

Semi-Precious Stone: Utnur has yielded a chalcedony core (Allchin 1961:43). A number of agate flakes and one flake each in jasper and chalcedony are reported from Sanganakallu (Subbarao 1948:26). Nodules of agate and chalcedony, often displaying fluted flake scars were noted at Maski (Thapar 1957:90).

Shell: At Tekkalakota, limited evidence of local shell-working is present in the form of (i) a piece of tortoise shell ground to a square shape for probably making an amulet and (ii) the upper end of a conch shell (Nagaraja Rao 1965:86).

The Raw Materials Found Within the Sub-Region

Ordinary Stone

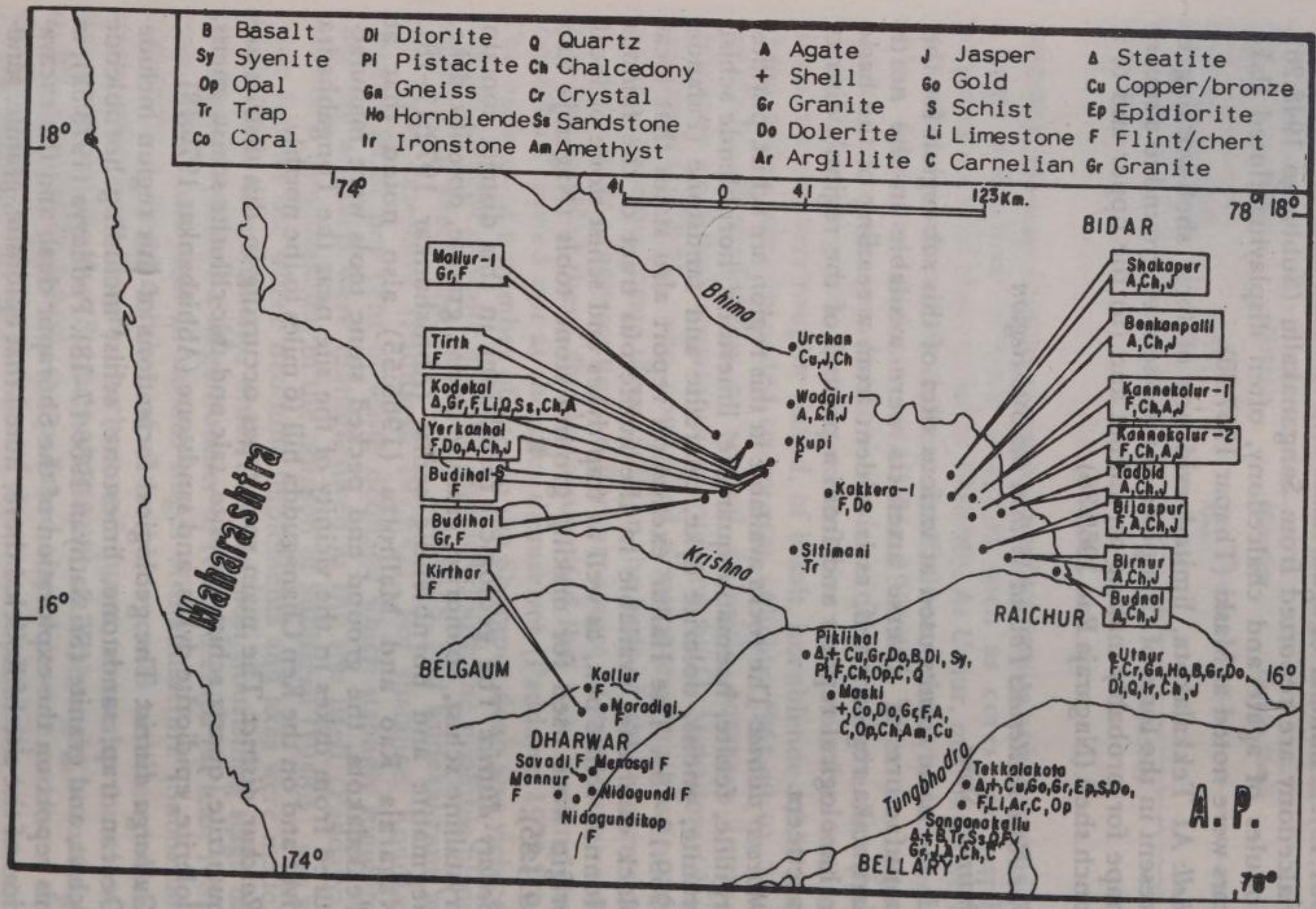
All the basic stones used at various sites of this sub-region for the manufacture of diverse artefacts were available in the north Karnataka region itself, as is evident from a reading of the basic archaeological reports and from a perusal of the region's district gazetteers.

Dharwar district: The rocks available in this region are schist, phyllite, argillite, felsite, haematite-quartzite, limestone, hornblende schist, granite, gneiss, dolerite dyke, quartzite and sandstone (Palande 1959:13–15). The Hallur excavation report also states that local black quartzite, available in the auriferous tract of the famous Honnali schist belt, as well as trap dykes and schist stone of local origin were used for making ground stone tools (Nagaraja Rao 1971:85).

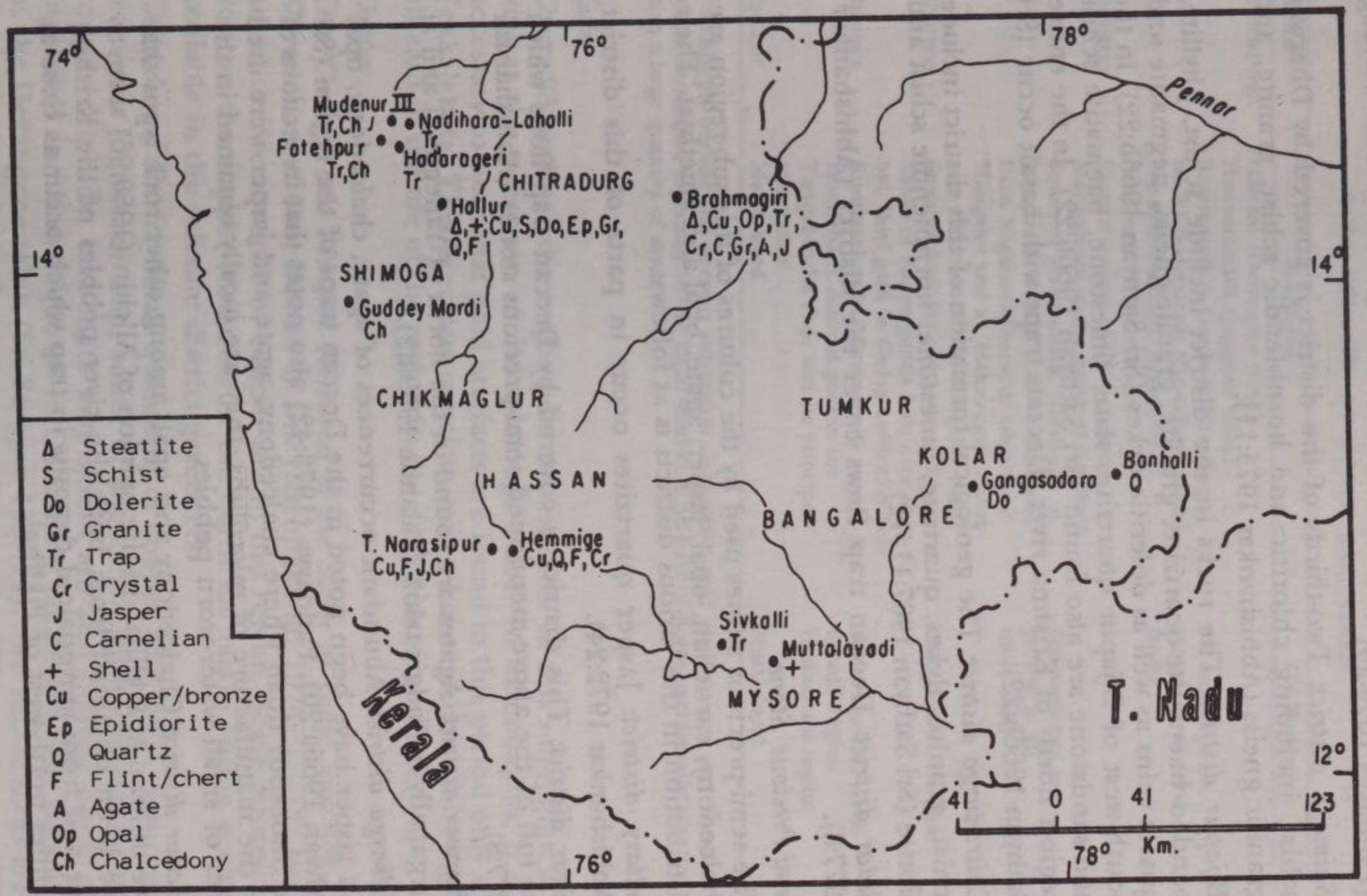
Bellary district: The geological formations in this district contain crystalline schist, epidiorite, granitic gneiss, granite, doleritic dyke, pegmatite and hornblendic schist (Abhishankar 1972:17–18). Nagaraja Rao and Malhotra (1965:55) also noted that at Tekkalakota, the ground and pecked stone tools were manufactured from dykes in the vicinity of the site near the Tungabhadra river and on the Ken Chanagudda hill (6 miles to the north).

Raichur district: The main rock types occurring in this district are quartzite, quartz schist, chlorite, talc and talc-chlorite schist, gneiss, dolerite, epidiorite dykes, and sandstone (Abhishankar 1970:13).

Gulbarga district: The geological formations of this region include Deccan trap, sandstone, limestone, schist including hornblende schist, and granite (Sri Sathyan 1966:17–18). Peddayya (1973:32), in his report on the exploration of the Shorapur doab and the excavation of the site of Kodekal there, noted that epidosite, granite, sandstone, chert, quartz and veined rock were found locally. In fact, chert is obtained in the Shorapur taluk in the form of flat nodules of handy sizes from the veins occurring in limestone formation;



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN KARNATAKA



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN KARNATAKA

such beds occur at Meralbhavi, Tirth, Rajankollur and Selvadgi (Paddayya 1973:42).

Shimoga district: Two-thirds of the district is covered by Dharwar schist, including chloritic and hornblendic schist, granite, and granitic gneiss (Abhishankar 1975:11).

Bijapur district: The rocks in the district include schist, phyllite, banded haematite-quartzite, granite, granite-gneiss, pegmatite and quartz veins as well as doleritic dykes (Sri Sathyan 1966b:22). In the south-west of Bijapur quartzite, slate, limestone, haematite schist and sandstone are also found (Sri Sathyan 1966b:22). In the entire region north of Krishna river, Deccan traps with basalt occur (Sri Sathyan 1966b:22).

Chitradurga district: The geological formation of this district include schist, granite, dykes, quartzite, limestone, hornblendic schist and diorite (Sri Sathyan 1967:11–12).

Bidar district: Deccan trap flows cover the district (Abhishankar 1977:8).

Semi-Precious Stone

The semi-precious stones used by the cultures of this sub-region are chalcedony, carnelian, opal, jasper, agate, opal and amethyst. Their distribution in the various districts is as follows:

Bellary district: Jasper quartzites occur in parts of this district (Abhishankar 1972:24).

Bidar district: This district is covered by Deccan trap flows which are full of the above-mentioned semi-precious stones (Abhishankar 1977:8).

Dharwar district: Agates are found in the north of Yanegundi and at Burgapally in Yadgir taluk (Palande 1959:22).

Gulbarga district: Abundant occurrences of agate, chalcedony, opal and jasper have been noted in the Deccan traps of the region (Sri Sathyan 1966a:20). Paddayya (1973:42) also notes that in sections of the Shorapur doab where chalcedony, agate and jasper were used for the manufacture of microliths, they are locally obtained in the form of small water-worn pebbles.

Raichur district: Chalcedony and opal, among other rock types that were utilized at Piklihal, in the opinion of Allchin (1960:96) seem to have been obtained from both the river pebbles of the Krishna river and from amygdaloid deposits in trap which occur as close as 25 miles north-west of Piklihal.

Steatite

Steatite is locally available in the Bellary region (Allchin 1962:209–10).

Chart 28
GOLD DEPOSITS OF NORTH KARNATAKA

District	*Sub-Region*	*Old Workings*
Chitradurga	Halekal (Davangere taluk) Honnemaradi (Jaggalur taluk) Kotemaradi & Gonur (Chitradurga taluk) Bodimaradi (Hosadurga taluk) Javangondanhalli, Annesidri & Dindivara (Hiriyur taluk)	old workings are present in all these taluks
Gulbarga	Eastern margin of the belt from Mavinamatti to the north of Kardhalli. South of Mavinamatti. North-east of Janapur & west of road to Kardhalli from Naganur. Shorapur taluk near Mangalur and at 'Makan-gavi'. Acharyara Bhavi, south of Mangalur road	Old workings are present in all these areas
Dharwar	Streams draining northern and western flanks of Kappatgudda hills near Dambal. Reef gold in Gadag auriferous belt	Gadag auriferous belt
Shinoga	Kundurekonda-Palavanahally region & Honnehatti. Alluvial gold in the Tungabhadra river and its principal tributaries	Kunurekonda-Palavanahally region. Honnehatti region
Raichur	Maski band	Maski band

* Although outside the present sub-region, important gold deposits are also found in South Karnataka, especially in the Kolar district. The gold of Kolar, incidentally, also contains a large quantity of silver

Gold

Chart 28 outlines the major gold occurrences in this sub-region as well as the presence of old workings there. In extenuation, it is necessary to note that gold artefacts are found in this period only at Tekkalakota. This precious metal seems to have become more significant in the life of the region in the early historical phase.

Copper

The *Geology and Mineral Resources of the States of India Part VII—Karnataka and Goa, Duman & Diu* (Karunakaran 1974a:12–13) has noted the occurrence of copper ore in this region. Some information on the copper resources of the north Karnataka region is also available in the relevant district gazetteers.

Chitradurga district: Small quantities of copper have been extracted from the Jogimardi trap, south of Ingladhal, while indications of copper sulphide, carbonate and oxides are also noticed north of Ingladhal and Kunchiganhal in Chitradurg taluk, and near Kaidala in the Devangene taluk (Sri Sathyan 1967:14). Ore occurrences are also reported from Baramsagara, Bistuvalle, Siddavandurga and Dodbathi villages (Karunakaran 1974a:12). Ancient workings for

copper ore have also been noticed on the western flanks of Belligudda hill, near Ingladahalle (Karunakaran 1974a:12).

Gulbarga district: A copper bearing lode has been established at Tinthini (Karunakaran 1974a:13).

North Kanara district: Sulphide occurrences in the Kaiga area contain copper ores (Karunakaran 1974a:13).

Dharwar district: Copper occurrences have been reported in the Doni stream flowing from the Kappatgudda hills as well as near Sortur and Jalligeri (Palande 1959:16).

Raichur district: Copper occurrences have been reported near Machnur and also near Mandargi, Chikhesrur and Hirehesrur (Abhishankar 1970:15).

Bijapur district: Traces of copper ore were noticed at Khajjidoni, four miles from Kaladgi (Sri Sathyan 1966b:23).

The Raw Materials Available Outside the Sub-Region

Since all the raw materials that were used by different sites in north Karnataka seem to have been found within its ambit, it is most unlikely that they were being procured from outside in any significant quantity. The only raw material that may possibly have been procured from Andhra Pradesh was steatite which was used for the production of beads and buttons at Hallur, Tekkalakota, Piklihal, Sanganakallu and Brahmagiri. Additionally, conch shell and coral could have been procured either from the east coast (see p. 193) or from the Travancore coast (Watt 1908:989).

Ceramic and Other Artefactual Links

The north Karnataka region shows strong ceramic affinities with Maharashtra (as is evident from the occurrence of Savalda ware and the Jorwe ware here) and, in a more limited way, with Malwa. While Savalda ware occurs in north Karnataka, it is important to note that there are distinct regional differences in the Savalda ware of the Krishna and the Tapti river valleys. Sundara (1971:18), for instance, has pointed out that some of the pottery in the grey ware, particularly with painting in jet black, white and brown, found at sites in the upper Krishna has no parallels in the sites of the Tapti region. These linkages between Maharashtra and the upper Krishna river valley came to be further consolidated and extended to other sections of north Karnataka in the subsequent period, as is evident from the occurrence of pottery of the Jorwe fabric at a number of sites here. Limited sherds of Jorwe fabric have been noted from Hallur (Nagaraja Rao 1971:33), Piklihal (Allchin 1960:xvi), Bijaspur (Paddayya 1973:10), Kannekolur-1 (Paddayya

1971:14), Hadarageri (Nagaraja Rao 1962–3:71), Madapur (Nagaraja Rao 1962–3:71) and Sanganakallu (Ansari and Nagaraja Rao 1969:23). Three sites yielding Jorwe ware in the Dharwar district were also noted by Nagaraja Rao (*I.A.R.* 1960–1:28) at Kowlet, Nalwagal and Nadiharalhalli. A. Sundara (1978:108) noticed painted and plain Jorwe ware at a number of sites in the Bhima valley. In addition to the occurrence of Jorwe ware at the above-mentioned sites, at Piklihal, similarities with approximately ten Jorwe forms, as well as similarities between the painted necks of pots in the AB ware of the site and Jorwe were noted; other minor similarities were also noted (Allchin 1960:59, 124). Similarities in the shapes of two ceramic types in the burnished grey ware of Maski, namely, a vase with a flared rim and a shallow dish, and prototypes in Nasik and Jorwe have also been reported by Thapar (1957:41). With regard to Malwa, at Hallur, huge jars in a coarse grey ware are similar to those used at Nevasa for multiple pot burials (Nagaraja Rao 1971:47). In the A2 grey ware of Utnur although some sherds which show a cream coloured slip suggest similarities with the cream slipped ware of Maheshwar and Nagda, Allchin (1961:35) has argued that they are not imports since their general characteristics are those of local neolithic wares. In the Shorapur doab, Type 22 (Bowl-or-dish-on-stand) and a high collar necked pot, as well as some designs in the incised pottery—herringbone bands, slashes, dot-like impressions, zig-zags and finger-nail impressions—are similar to those found at Navdatoli, among other sites.

Discussion

One important conclusion that can be arrived at on the basis of the detailed appraisal made, is that, although contact of some significance is evident between Maharashtra and north Karnataka, there is not enough ground to claim that this contact was sufficiently intensive to suggest an actual large-scale migration from Karnataka through the Krishna valley into Maharashtra (cf. Dhavalikar 1978:41–2). Firstly, while the Savalda ware is found at a number of sites in the Krishna river valley region, there are differences between its occurrence there and in the Tapti region as well as between them and the Savalda ware culture at Daimabad where again, it seems to have its own regional strains (Sali 1986:219). Secondly, Jorwe pottery is admittedly found at a number of sites in north Karnataka, its distribution being from the Gulbarga region to Raichur and Dharwar. However, in almost all cases, it occurs in very limited quantities and seems to have found its way there through interregional trade rather than through the actual physical migration of people. An assessment of the resources utilized and available in this sub-region, however, clearly shows that no raw

materials need have been procured from Maharashtra. The ceramic affinities with Malwa, confined mostly to similarities in certain designs and shapes, and the presence of a burnished grey pottery at Nevasa, at best demonstrate the existence of limited contact, not specifically useful in suggesting the existence of trade relationships.

South Karnataka

South Karnataka basically constitutes the southern upland region of the *Maidan*. In comparison to its northern counterpart, it is higher and more rugged consisting of 'a series of rolling plateaux culminating into highly irregular and disjointed granitic hills between Tumkur and Kolar' (Singh et al. 1987:794). Protohistoric sites are found in the Mysore, Kolar, Bangalore, Mandya and Tumkur districts (Krishnamurthy 1971, 1978; *I.A.R.* 1979–80:101–2; 1981–2:11), T. Narasipur and Hemmige being among the important ones (Seshadri 1971a, 1971b; Rao and Nagaraju 1974). Although Paddayya (1973:89) has included T. Narasipur and Hemmige as well as other sites of this region within what he calls 'Variant 3' of the Southern Neolithic cultural area, made up of sites in the upper reaches of the Tungabhadra including Hallur in the Dharwar district, the sites of south Karnataka are not only geographically separated from the latter but also seem to have a separate cultural identity.

The Sitewise Distribution of Raw Materials

Chart 29 outlines the raw materials that were exploited at the various sites of this sub-region. These are shell, copper/bronze, quartz, dolerite, trapstone, chert, crystal, jasper and chalcedony.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Gangasandara, T. Narasipur and Hemmige have provided evidence for the local manufacture of stone artefacts. At Gangasandara, a neolithic factory site for the manufacture of dolerite artefacts was noted (*I.A.R.* 1974–5:20). T. Narasipur has yielded four pieces of fluted cores of black/greenish chert. Black chert and crystal fluted cores were also found at Hemmige ((*I.A.R.* 1963–4:27).

Chart 29

SOUTH KARNATAKA—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Banhalli*	*Gangas-adara*	*Muttala-vadi*	*Sivk-alli*	*Hemm-ige*	*T. Narasipur*
Shell			bead			
Copper/ Bronze					piece	bead
Ordinary Stone	Quartz cores	Dolerite artefacts		Trapstone implements	Quartz cores. Chert blades, cores. Crystal cores & blades	Chert cores
Semi-Precious Stone					Jasper blades. Chalcedony cores & blades	

The Raw Materials Found Within the Sub-Region

Ordinary Stone

The Mysore state gazetteers enumerate the various geological formations and rock types found in the districts of South Karnataka.

Kolar district: Considerable quantities of quartz, including opalescent quartz and dolerite dykes are found here (Abhishankar 1968:16);

Bangalore district: The prevailing rocks are gneiss disrupted by trap seam, rock crystal, smoky and milky quartz as well as chert (Rice 1876:2–3);

Mysore district: In the old Mysore district, the geological formation is principally granite, gneiss, quartz, syenite and hornblende (Rice 1876:193). Nodules of flint called *chakmukki* are found in the east of the district (Rice 1876:194).

Semi-Precious Stone

Chert and chalcedony are found in considerable quantities in the Bangalore district (Rice 1876:3).

Copper

The presence of copper ore in small quantities in the Mysore district was noted in the 1929 edition of the *Mysore Gazetteer* (Hayavadana Rao 1929:208–9). The Geological Survey publication on the resources of Karnataka (Karunakaran 1974a:12) further notes that these are reported from the Halavanahundi,

Kalmaturdoddi, Porsekarundapalayam and Adamalnattan areas of Mysore district.

The Raw Materials Available Outside the Sub-Region

The archaeological data seem to show that no raw materials were procured from outside the sub-region.

Ceramic and Other Artefactual Links

T. Narasipur has yielded small quantities of black-on-red painted pottery, wheel turned and resembling in fabric the Jorwe ware of Maharashtra (Seshadri 1971b:2). However, the surface slip is different, being comparatively fast in colour and burnished (Sheshadri 1971b:2).

Discussion

Like north Karnataka, the southern uplands also seem to have been sharing in the general interaction with the Maharashtra region whose Jorwe ware is found in a limited quantity at T. Narasipur.

Tamil Nadu

Tamil Nadu is a rhomboid shaped territory bordered on the north-west and north by the Karnataka plateau (Ramesh and Gopalakrishnan 1987:851). On its west, the Ghats form a straight barrier, removed from the sea by a stretch of 80 to 160 km with two prominent gaps, the Palghat and the Shencottah. The Eastern Ghats in this region do not have any high peak worthy of mention. Neolithic sites have been located mainly in the North Arcot and Dharmapuri districts while a neolithic presence is noted, albeit, to a very limited extent, in the Salem and Chingleput districts as well. In addition to brief notes in *Indian Archaeology—A Review*, accounts of the protohistoric archaeology of the region are also available in some secondary works (Narasimhaiah 1978, 1980; Ramachandran 1980).

The Sitewise Distribution of Raw Materials

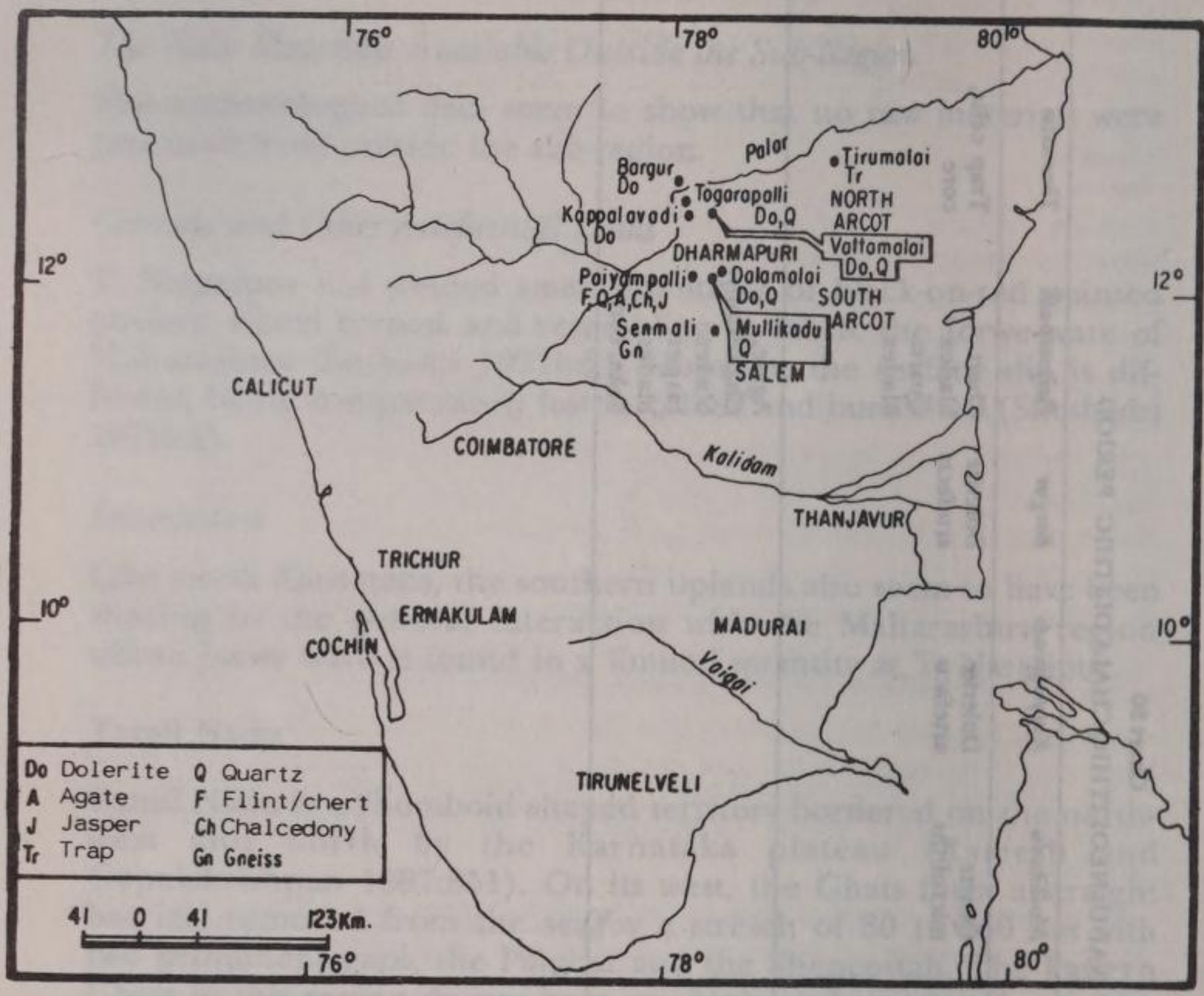
Chart 30 contains the basic information on the distribution of various raw materials in the neolithic sites of the region. Briefly, these are dolerite, gneiss, quarzite, quartz, trapstone, agate, chalcedony, jasper and chert.

Chart 30

TAMIL NADU–NEOLITHIC-CHALCOLITHIC PERIOD

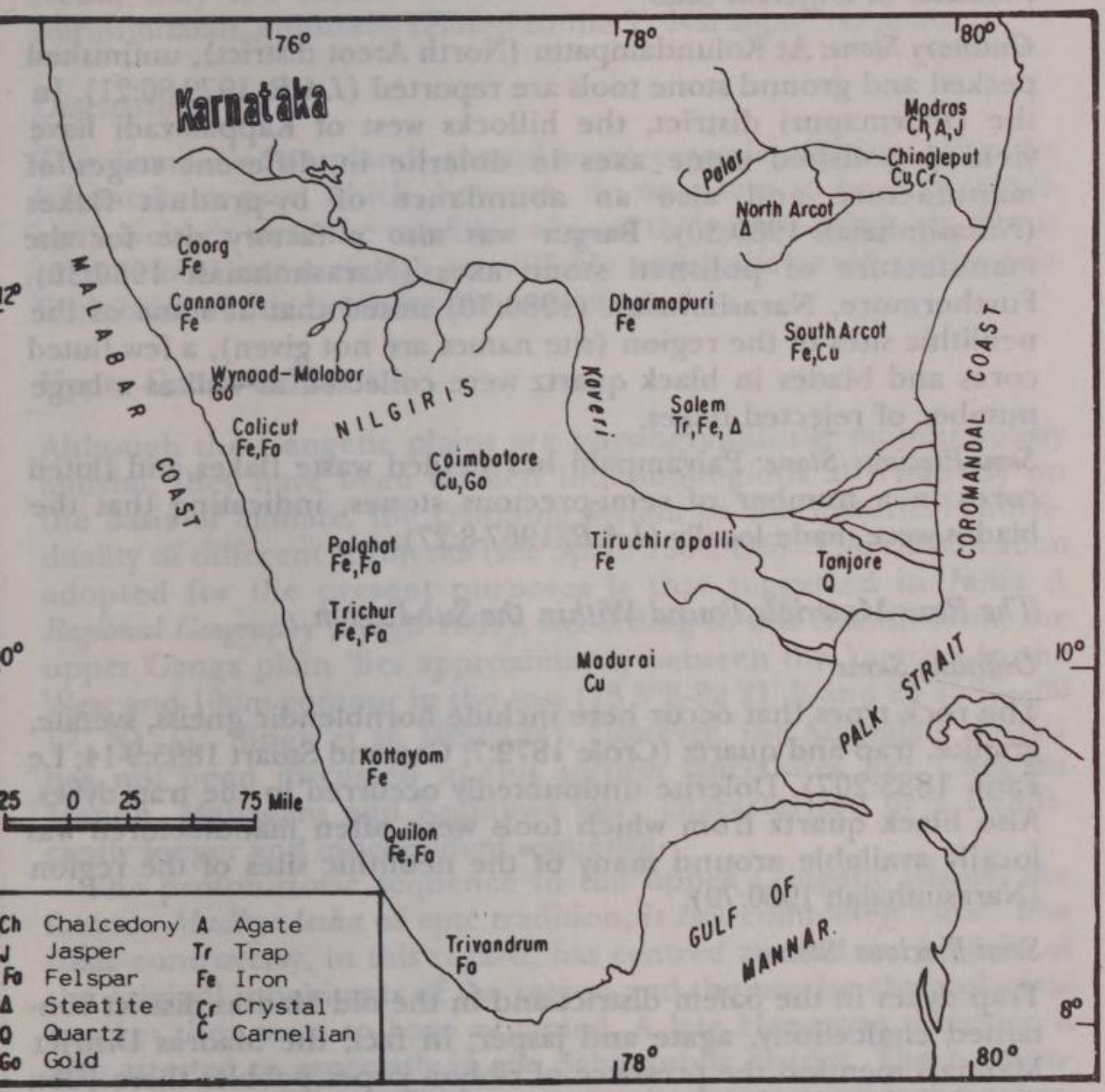
Raw Material	*Vattalamalai*	*Dalamalai*	*Togarapalli*	*Mullikadu*	*Kappalavadi*	*Bargur*	*Paiyampalli*	*Tirumalai*	*Senmali*
Ordinary Stone	Dolerite axes, wedges, hammer stones. Quartzite palette, quern. Quartz microliths	Dolerite axes, wedges, hammerstones. Quartz microliths	Dolerite axes, wedges, hammerstones. Quartz microliths	Quartz microliths	Dolerite artefacts	Dolerite artefacts	Chert blades. Quartz blades	Trap celts, core	
Semi-Precious Stone							Agate, Chalcedony, blades. Jasper blades, flake, core		Gneiss celt

Map 23



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN TAMIL NADU

Map 24



RAW MATERIALS AVAILABLE IN TAMIL NADU AND THE SOUTH WESTERN COAST

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: At Kolundampattu (North Arcot district), unfinished pecked and ground stone tools are reported (*I.A.R.* 1979-80:21). In the Dharmapuri district, the hillocks west of Kappalavadi have yielded polished stone axes in dolerite in different stages of manufacture and also an abundance of by-product flakes (Narasimhaiah 1980:30). Bargur was also a factory site for the manufacture of polished stone axes (Narasimhaiah 1980:30). Furthermore, Narasimhaiah (1980:70) noted that at some of the neolithic sites of the region (site names are not given), a few fluted cores and blades in black quartz were collected as well as a large number of rejected flakes.

Semi-Precious Stone: Paiyampalli has yielded waste flakes and fluted cores in a number of semi-precious stones, indicating that the blades were made locally (*I.A.R.* 1967-8:27).

The Raw Materials Found Within the Sub-Region

Ordinary Stone

The rock types that occur here include hornblendic gneiss, syenite, granite, trap and quartz (Crole 1879:7; Cox and Stuart 1895:9-14; Le Fanu 1883:207). Dolerite undoubtedly occurred in the trap dykes. Also black quartz from which tools were often manufactured was locally available around many of the neolithic sites of the region (Narasimhaiah 1980:70).

Semi-Precious Stone

Trap dykes in the Salem district and in the old Madras district contained chalcedony, agate and jasper; in fact, the Madras District Manuals mention the presence of ribbon jasper pebbles there (Cox and Stuart 1895:14).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the region.

Ceramic and Other Artefactual Links

We do not have any published information on the occurrence of any intrusive pottery types in the neolithic sites of this region. However, at Paiyampalli in North Arcot (*I.A.R.* 1967:28), there is a lipped bowl with a round base. This is common to a number of neolithic sites in Karnataka. This type in fact was painted in red ochre on the rim, which is another trait common to contemporary

sites of Karnataka. Whatever intrusive ceramic traits exist in Tamil Nadu, they are mainly of Karnataka origin, and according to Narasimhaiah, culturally related to the T. Narasipur complex.

Discussion

The Tamil Nadu uplands shared some ceramic affinities with the Karnataka region, which, however, do not seem to be very significant. Neither were the neolithic sites of the region using any exotic or non-local raw materials unavailable within the ambit of the neolithic-chalcolithic horizons themselves.

Upper Gangetic Plains

Although the Gangetic plains are physiographically monotonously alluvial, they have been divided into sub-regions alternatively on the basis of climate, the cropping system or the historical individuality of different segments (see Spate 1964:496). The classification adopted for the present purposes is that suggested in *India A Regional Geography* (Singh 1987). According to this classification, the upper Ganga plain 'lies approximately between the Yamuna in the West and 100m contour in the east (73 3"E-82 21' E and 25 15'N—30 17" N)' (U. Singh et al. 1987:124). However, the Allahabad district has not been discussed in this section since sites like Chopani Mando, Mahagara and Kolidhwa were characterized by a significantly longer and independent sequence.

The protohistoric sequence in the upper Gangetic plains, the famous *Madhyadesha* of epic tradition, is not completely clear. The basic controversy, in this regard, has centred around the identity of the original inhabitants of the region and the precise chronological bracket they seem to have occupied. A late Harappan presence is also attested to especially in the Saharanpur district. The relationship of this tradition with the people whose type fossil is the ochre-coloured ware, a rolled, badly fired ware that was first discovered in a stratigraphic context at Hastinapura (B.B. Lal 1954 & 1955), has been discussed at length (Deva 1969; B.B. Lal 1969; Gaur 1973, 1974; Dikshit 1979). It has been argued that the ochre ware pottery people were the original inhabitants of the region and that, with the advent of the Harappans, a part of the population moved east, as far as central Doab (Gaur 1983:73). That a relationship of some sort existed between the ochre-coloured pottery phase and the copper hoards, including different types (for an overview of the copper hoard problem see M. Lal 1980-1:34ff) of celts, swords etc. that have been found in a large number of districts is also reasonably clear (cf. Saipai; B.B. Lal 1951. 1972). On the basis of thermoluminiscence dating from Atranjikhera, Lal Qila, Jhinjhina

and Nasirpur, as well as cultural evidence, B.B. Lal has suggested that the ochre coloured ware/copper hoard culture was in existence between 2000 and 1500 BC. The subsequent cultural phase was marked by black-and-red ware (Singh 1969, 1982) and is found in the Kanpur, Aligarh, Budaun and Bulandshahr districts.

The Sitewise Distribution of Raw Materials

Chart 31 exemplifies the raw materials used at various sites which include agate, carnelian, chalcedony, jasper, sandstone, chert, quartzite, copper/bronze and shell. Chart 32 outlines the copper hoards found in the Gangetic plains.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: At Atranjikhera (I), fragments of querns and pestles in sandstone, and one fragment in quartzite, are reported (Gaur 1983:68-9).

Chart 31

UPPER GANGETIC PLAINS—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Gadhrona*	*Ambkheri*	*Bargaon*	*Saipai*	*Jakhera*	*Lal Qila*	*Atranjikhera*
Shell							bead
Ordinary Stone			Chert blade	Sandstone balls, pounders, rubbers, querns, palletes. Chert blade			Sandstone quern, pestle fragments, indeterminate object, ball. Quartzite quern fragment, pebble, burnisher, blade
Semi-Precious Stone	Agate beads	Carnelian bead		Chalcedony flake	Agate cores. Jasper bead		Carnelian beads. Agate bead, cores
Copper/ Bronze			rings	spearhead, harpoon	bangle	pendant, arrowhead fragment, celt fragment, indeterminate object	ring, unfinished bead

Chart 32

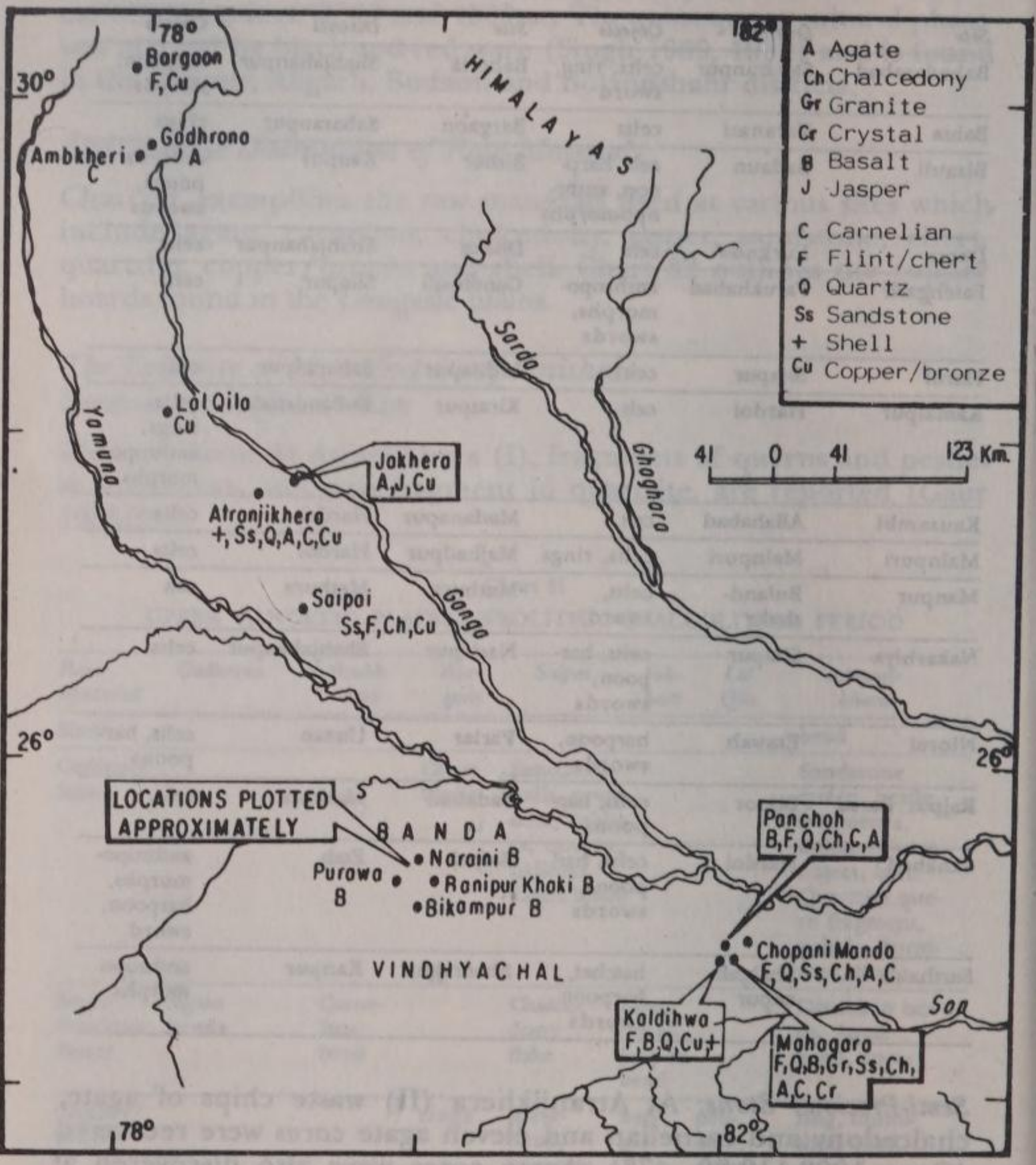
COPPER HOARDS IN UTTAR PRADESH

Site	*District*	*Objects*	*Site*	*District*	*Objects*
Bahadarabad	Saharanpur	celts, ring, sword	Baheria	Shahjahanpur	harpoon, swords
Balua	Varanasi	celts	Bargaon	Saharanpur	rings
Bisauli	Badaun	celt, harpoon, anthropomorphs	Bithur	Kanpur	celts, harpoons, swords
Deoti	Lucknow	celt	Dhaka	Shahjahanpur	celts
Fatehgarh	Farukhabad	anthropomorphs, swords	Gandhauli	Sitapur	celts
Hardi	Sitapur	celt	Indilapur	Saharanpur	celt
Kamalpur	Hardoi	celt	Kiratpur	Bullandshahr	celts, rings, anthropomorphs
Kausambi	Allahabad	celt	Madanapur	Hardoi	celts
Mainpuri	Mainpuri	celts, rings	Majhadpur	Hardoi	celts
Manpur	Bulandshahr	celts, sword	Mathura	Mathura	celt
Nakarhiya	Sitapur	celts, harpoon, swords	Nasirpur	Shahjahanpur	celts
Niorai	Etawah	harpoon, swords	Pariar	Unnao	celts, harpoons
Rajpur Parsu	Bijnor	celts, harpoons	Sadabad	Mathura	celts
Sahabad	Hardoi	celts, harpoons, swords	Saipai	Etah	anthropomorphs, harpoon, sword
Sarthauli	Shahjahanpur	hatchet, harpoon swords	Sheorajpur	Kanpur	anthropomorphs

Semi-Precious Stone: At Atranjikhera (II) waste chips of agate, chalcedony and carnelian and eleven agate cores were recovered (Gaur 1983:119-20, 473). Agate cores were also discovered at Jakhera (*I.A.R.* 1974-5:49). One chalcedony flake was noted at Saipai (*I.A.R.* 1970-1:38).

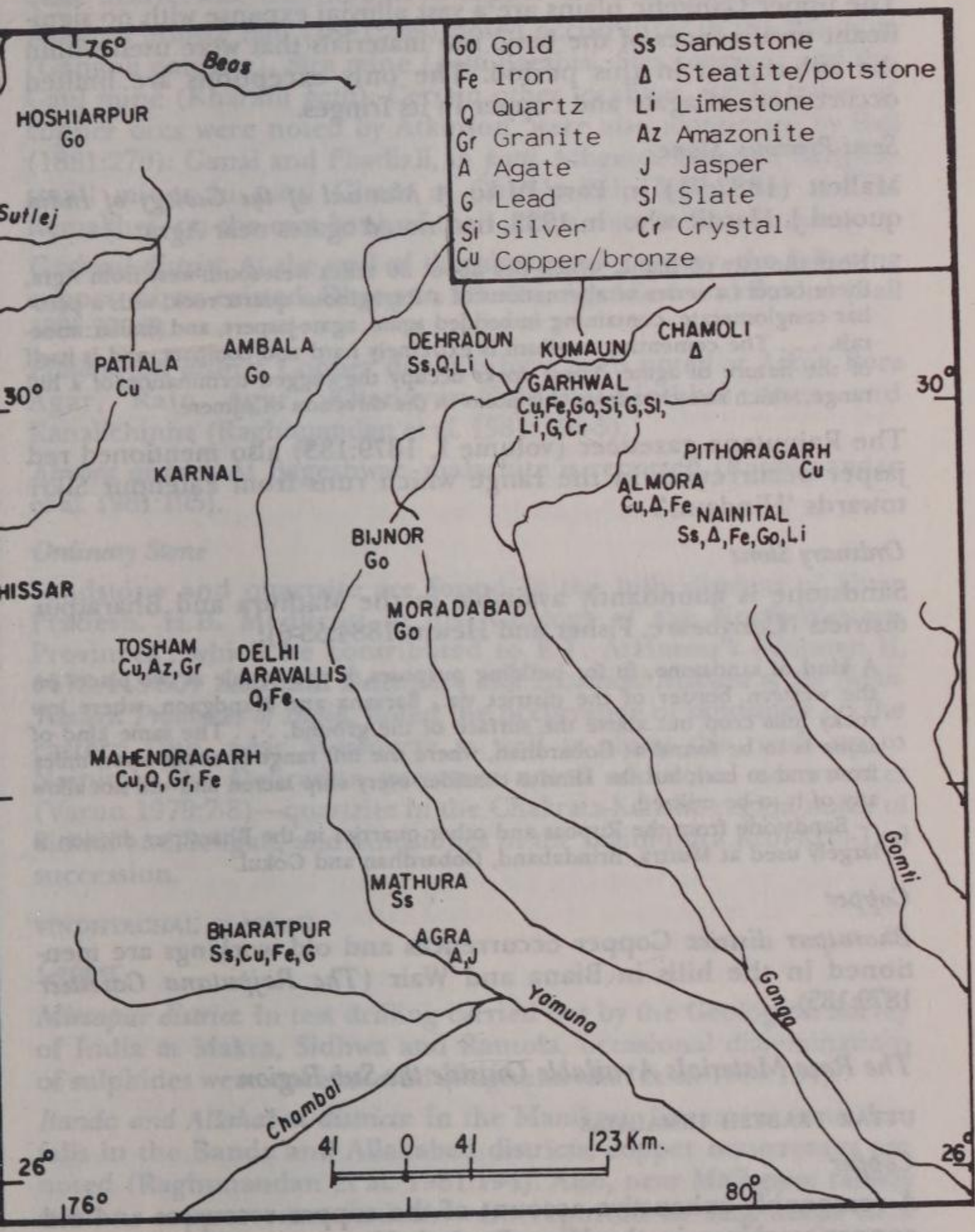
Copper/Bronze: An unfinished bead was noted at Atranjikhera (II) (Gaur 1983:116).

Map 25



NEOLITHIC–CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE UPPER GANGETIC PLAINS AND THE VINDHYACHAL PLATEAU

Map 26



RAW MATERIALS AVAILABLE IN THE INDO-GANGETIC DIVIDE, THE UPPER GANGETIC PLAINS AND THE U.P. HIMALAYAS

The Raw Materials Found Within the Sub-Region

The upper Gangetic plains are a vast alluvial expanse with no significant occurrences of the basic raw materials that were used within the sub-region in this period. The only exceptions are limited occurrences of agate and copper in its fringes.

Semi-Precious Stone

Mallett (1887:71) in Part IV to *A Manual of the Geology of India* quoted J. Hardie who, in 1833, had noted agates near Agra:

> Near the city of Biana, which lies about 50 miles west-south-west from Agra, there occurs a series of alternations of a ferruginous quartz rock, with a peculiar conglomerate, containing imbedded agate, agate-jaspers, and similar minerals. . . . The cementing medium is extremely hard and compact, and is itself of the nature of agate. These rocks occupy the rugged termination of a hill range, which stretches from this point in the direction of Ajmere.

The Rajputana gazetteer (volume I, 1879:133) also mentioned red jasper occurrences in the range which runs from Fatehpur Sikri towards 'Hindaun'.

Ordinary Stone

Sandstone is abundantly available in the Mathura and Bharatpur districts (Conybeare, Fisher and Hewitt 1884:55-6):

> A kind of sandstone, fit for building purposes, is procurable at two places on the western border of the district viz., Barsana and Nandgaon, where low rocky hills crop out above the surface of the ground. . . . The same kind of stone is to be found at Gobardhan, where the hill range is about seven miles from end to end; but the Hindus consider every chip sacred and will not allow any of it to be utilized.
>
> Sandstone from the Rupbas and other quarries in the Bharatpur division is largely used at Muttra, Brindaband, Gobardhan and Gokul.

Copper

Bharatpur district: Copper occurrences and old workings are mentioned in the hills in Biana and Wair (*The Rajputana Gazetteer* 1879:135).

The Raw Materials Available Outside the Sub-Region

UTTAR PRADESH HIMALAYAS

Copper

A reasonably exhaustive account of the copper resources and old copper workings in the Uttar Pradesh Himalayas in found in Part II of *A Manual of the Geology of India* (Ball 1881). The regional surveys carried out for mapping copper resources in the post-independence period have been discussed in detail in the *Bulletins of the*

Geological Survey of India No. 47 (Raghunandan et al. 1981). The basic district-wise distribution of copper ore is as follows:

Kumaun district: Ball (1881:269) noted occurrences in the Rai mine (Gangoli pargana), Sira mine (*patti* Barabisi, Sira pargana) and the Gaul mine (Kharahi *patti*). Certain other localities, where traces of copper ores were noted by Atkinson, were also mentioned by Ball (1881:270): Ganai and Phadiall, in *patti* Athgaon, pargana Gangoli, small mines in patti Giwar at Chin-ka-kali, Beler, Sor and at Kemakhet, on the east bank of the Ladhya river in Kali Kumaun.

Garhwal district: At the end of the nineteenth century, the following copper mines existed: Dhanpur, Dhobri, Agar Sera and Pokhri (Ball 1881:270-2).

Pithoragarh district: Copper deposits have been noted at Askot, Bora Agar, Rain Agar, Khanayun-Galpakot-Kimkhet Area and Kanalichinna (Raghunandan et al. 1981: 190-5).

Almora district: At Bageshwar, malachite is reported (Raghunandan et al. 1981:195).

Ordinary Stone

Sandstone and quartzite are found in the hilly districts of Uttar Pradesh. H.B. Medlicott in his 'Geology of the North-Western Provinces', which he contributed to E.T. Atkinson's (Volume II, 1875:448-50) *Statistical Descriptive and Historical Account of the North-Western Provinces of India,* noted the occurrence of sandstone on the eastern Dun, near Mussoorie as well as along the roads up to Nainital. The Dehradun gazetteer noted additional occurrences (Varun 1979:7-8)—quartzite in the Chakrata-Kailane region north of Sidhol and Seligad, and sandstones in the Blaini-Infra Krol-Krol-Tral succession.

VINDHYACHAL PLATEAU

Copper

Mirzapur district: In test drilling carried out by the Geological Survey of India at Makra, Sidhwa and Rantola, occasional disseminations of sulphides were encountered (Raghunandan et al. 1981:154).

Banda and Allahabad districts: In the Manikpur lineament zone that falls in the Banda and Allahabad districts, copper occurrences are noted (Raghunandan et al. 1981:194). Also, near Majhgaon railway station, copper encrustations were reported in slag heaps in a forested area (Raghunandan et al. 1981: 194).

Gwalior district: Copper occurrences have been noted at Antri, Kurol and Bhagesh-Gijora (Raghunandan et al. 1981:48).

Agate and Carnelian

Banda district: Mallet (1887:72) noted that agates and carnelian, cut at Banda, were brought down by the Ken river from the Trappean area.

Gwalior district: R.C. Gaur (1983:473) noted the possibility of Atranjikhera procuring agate, chalcedony and carnelian from Ranthambhor, Khandar, Dhumarmal Ka Darwaza north-west of Gwalior or from some area nearby in that belt. Additionally, it has been noted that large areas in the south of the district, in Shivpuri and Guna areas, are covered with Deccan traps (Krishnan 1965:11).

Ordinary Stone

The Kaimur plateau which begins at the southern alluvial fringe of the Allahabad district is well known for its Kaimur sandstone, normally of a light reddish colour (see Steel 1884:9; Joshi 1968:13). In the nineteenth century, its beds used to be worked in the quarries in the neighbourhood of Chunar, near Mirzapur, and at Shiurajpur in the Allahabad district.

Ceramic and Other Artefactual Links

At different sites in this region, ranging from Manpur and Bhatpura in Bulandshahr district (*I.A.R.* 1960-1:66) to Ambkheri in Saharanpur district (*I.A.R.* 1963–4:56; Gaur 1983:73) and right up till Ahichchhatra in Bareilly district (*I.A.R.* 1964–5:39), potsherds displaying close parallels with the Harappan material have been noted. Among the common elements that have been highlighted in this context are the jar with splayed-our rim, the storage jar with a slightly beaded rim, the basin with splayed-out rim, the bowl with everted rim, the bowl-like lid with central knob and the dish-on-stand. The occurrence of an etched carnelian bead, barrel circular in form at Atranjikhera (II) is also extremely significant (Gaur 1983:116). This is undoubtedly of Harappan provenance since in the protohistoric context in India, etched carnelian beads are rarely found outside the artefactual repertoires of Harappan sites.

Discussion

The upper Gangetic plains were involved in interactions of various kinds with Punjab and Haryana, the U.P. Himalayas and the Bagelkhand-Bundelkhand axis. The cultural elements that the O.C.P. phase shared with late Harappan sites in Punjab and Haryana are strikingly clear from the ceramic analogies and, in fact, the presence of an etched carnelian bead at Atranjikhera in the black-and-red ware culture should establish, once and for all, the contact between these two cultural zones. To the Himalayan

mountains on their north, the various sites of this region looked for copper and some kinds of stones. Semi-precious stones like carnelian, agate and jasper may have come from the Agra region. At the same time, since they were being exploited from the epi-palaeolithic period in the Vindhyan plateau, with which the interaction of the Gangetic valley has been documented to a very early mesolithic phase, the possibility of these semi-precious stones as well as sandstone coming from there is strong. Copper resources are also known to exist in the Bagelkhand-Bundelkhand region.

The Vindhyachal Plateau

The Vindhyan plateau, a term originally used by the Geological Survey in the nineteenth century to designate the sandstone formation of Bundelkhand and Malwa, constitutes basically the scarped range along the northern side of the Narbada valley that stretches till the south of the Allahabad district where the alluvial formation of the Gangetic plains begins (Oldham 1893—*A Manual of the Geology of India Stratigraphical and Structural Geology*). Mainly due to the work done by the late G.R. Sharma and his colleagues at the Allahabad University, this region must be considered as 'an original, primary and nuclear centre of neolithic transformation, for the beginnings of agriculture, of rice and of domestication of animals' (Sharma et al. 1980:31). The work of the Allahabad university team, in fact, has provided striking archaeological evidence of the evolution of a cultural complex stretching back to the epi-palaeolithic to the advanced mesolithic or proto-neolithic (Sharma et al. 1980:31). Elements of the neolithic complex of the Belan and Son valleys, which is the focus of the present section, and which is marked by cord impressed ware, microliths and miscellaneous stone objects, have been discovered as far as the rockshelters of Lekhahia and Ghagharia on the Kaimur.

The Sitewise Distribution of Raw Materials

Chart 33 outlines the raw materials exploited at different sites in this region, Briefly, these are chalcedony, agate, carnelian, crystal, chert, basalt, quartz, quartzite, sandstone, granite, shell and copper.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Evidence for local lithic manufacture is available from Mahagara, Chopani Mando and Koldihwa. At Mahagara, with one exception, all the huts were used for purposes of lithic manufacture (Sharma et al. 1980:20). The high percentage of debitage, with chert as the principal raw material (83.86 per cent of the total assemblage) is ample testimony of local manufacture

Chart 33

VINDYACHAL REGION–NEOLITHIC- PERIOD

Raw Material	*Chopani Mando*	*Koldihwa*	*Mahagara*	*Panchoh*	*Naraini*	*Ranipur Khaki*	*Bhikrampur*	*Purawa*
Ordinary Stone	Chert microliths. Quartzite objects including ringstones, rubbers, mullers & miscellaneous objects. Sandstone objects including ringstones, rubbers, mullers	Chert microliths. Basalt celts. Quartz cores, blades, flakes, points, lunates, scrapers	Chert microliths. Quartz microliths. Basalt chisel, adzes. Sandstone quern, muller, rubbers, tool, fabricator. Sandstone balls, discs. Granite objects	Basalt neoliths. Chert, Quartz microliths	Basalt celts, adzes, hammer, pounders	Basalt celts, adzes, hammer, pounders	Basalt celts, adzes, pounders	Basalt celts, adzes, pounders
Semi-Precious Stone	Chalcedony, Agate & Carnelian microliths		Chalcedony Agate, Carnelian, Crystal microliths	Chalcedony Agate, Carnelian microliths				
Copper/ Bronze		fragmentary pieces						
Shell		beads, pendants						

(Sharma et al. 1980:162). At Chopani Mando also, 91. 26 per cent of the lithic collection was made of waste material, including cores and flakes (Sharma et al. 1980:54). Raw material in the form of pebbles and nodules as well as a number of artefacts including ringstones in different stages of manufacture, constitute additional evidence of local working (Sharma et al. 1980:37). At Koldihwa, the large number of microliths include several specimens of cores as well (*I.A.R.* 1973–4:27).

The Raw Materials Found Within the Sub-Region

The occurrences of chert, chalcedony, carnelian, agate, quartzite, jasper and sandstone as well as copper in this region have already been mentioned (pp. 221–22). In the introduction to the excavation report of Chopani-Mando, Mahadaha and Mahagara, Sharma et al. (1980:2) also noted the fact of their local availability: 'The presence of stones like quartzite, chert, chalcedony, agate, carnelian, jasper, quartz and other fine grained rocks in the nearby Kaimur and in some places of undulating plateau as also in the sections built by the river offered to man a rich supply of raw material at the various stages of his existence. . . .'

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

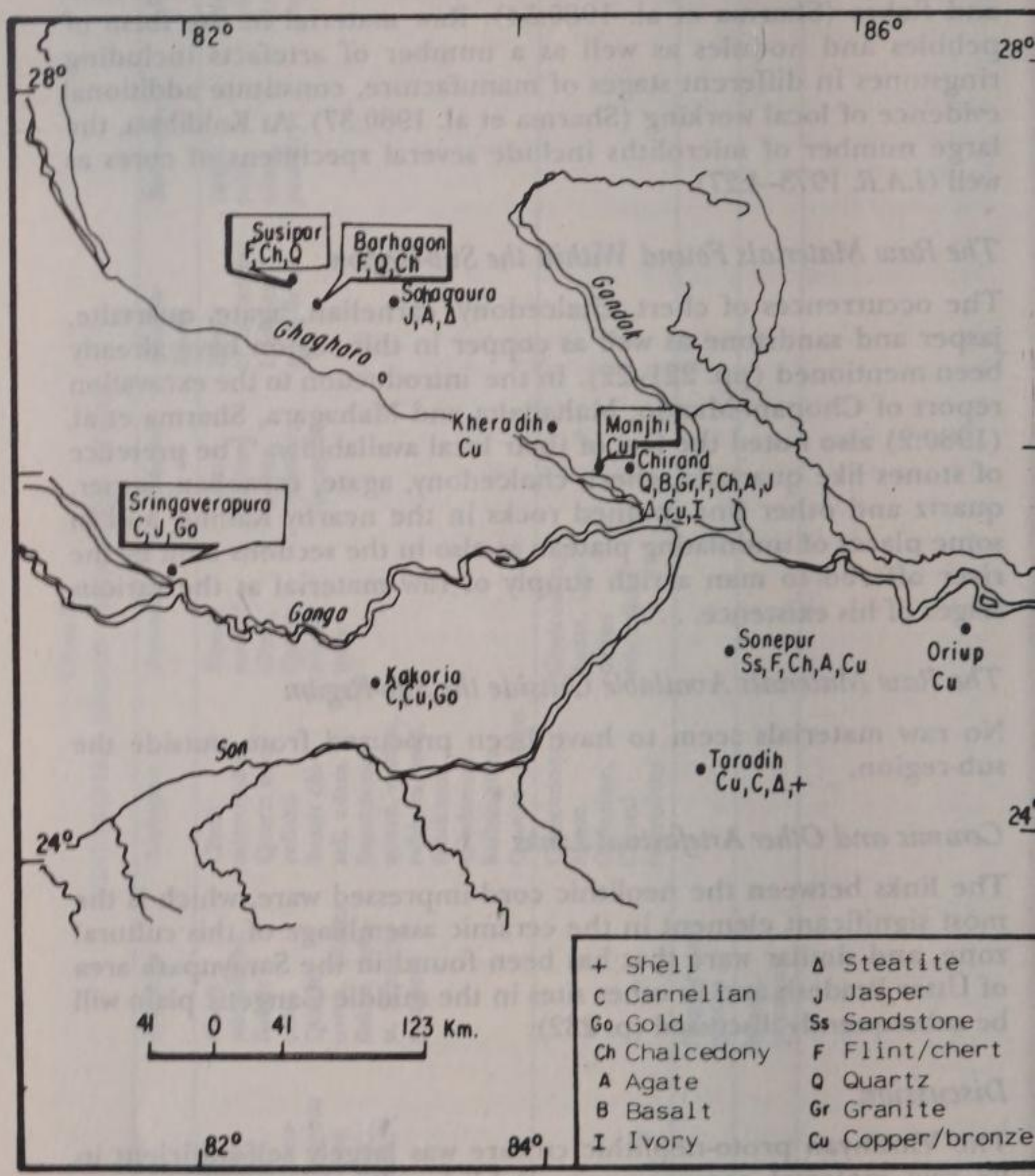
Ceramic and Other Artefactual Links

The links between the neolithic cord impressed ware, which is the most significant element in the ceramic assemblage of this cultural zone, and similar ware that has been found in the Sarayupara area of Uttar Pradesh and in other sites in the middle Gangetic plain will be subsequently discussed (p. 232).

Discussion

The Vindhyan proto-neolithic culture was largely self-sufficient in its raw material requirements. Additionally, it provided semi-precious siliceous materials, and other kinds of stones, among other resources, to the Gangetic plains where stones like agate, jasper and carnelian were being manufactured into different artefacts in the upper Gangetic and the middle Gangetic doab. The presence of cord impressed pottery, the type fossil of the sites of the sub-region under discussion, in different segments of the Gangetic plains, also throws light on the links that existed between them and the Vindhyan plateau.

Map 27



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE MIDDLE GANGETIC PLAINS

Middle Gangetic Plains

The middle Ganga plains, the heartland of inner India, include the Sarayupara region till the Himalayan foothills, on the one hand, and the southern Ganga Magadha-Anga plain till the Ganga Son divide, from where the peninsular region begins, on the other. Culturally, in the period under discussion, we see different cultural elements within the sub-region: the major zone seems to be the cultural stratum represented at Chirand where a neolithic and chalcolithic horizon is reported (Verma 1970–1)—the black-and-red ware phase of Chirand is represented at other sites in Gaya, Vaishali, Basti, Bhagalpur, Deoria, Balia, Mirzapur and Varanasi (Prasad 1987: *I.A.R.* 1956–7:19; 1962–3:30–4; 1963–4:43–5; 1970–1:36; 1976–7:14; 1982–3:13). Secondly, we have the sequence of the Sarayupara region of Uttar Pradesh which is fairly widespread, extending over a large part of the Ghaghara-Rapti interfluve (Singh et al. 1983–5, 1986–7; Singh and Lal 1985, Chaturvedi 1985). Thirdly, in the Allahabad district flourished Sringaverapura whose red ware phase (Period I) is significantly different from the rest of the region and displays similarities, according to B.B. Lal and K.N. Dikshit (1978–9), if any, with the Ochre-Coloured ware of the upper Gangetic doab. Kausambi, situated at the point where the trunk route to Central India branched off, does not seem to have been of any great significance in this period and, period I at the site seems to be oriented eastward.

The Sitewise Distribution of Raw Materials

Chart 34 outlines the raw materials exploited at different sites in this region. These are copper/bronze, conch shell, steatite, soapstone, chalcedony, agate, chert, sandstone, basalt, granite, carnelian, jasper, quartz, crystal, gold and ivory.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: Evidence of local manufacture of stone tools comes from Chirand, Maner, Sonpur, Susipar, Barhagon, Manjhi and Oriup. At Chirand, waste materials including flakes and cores testify to manufacture of microliths at the site itself (*I.A.R.* 1964–5:7). A number of chert nodules have also been found (Verma 1970–1:20). A single fluted core was found at Maner village (*I.A.R.* 1965–6:9). A waste stone chip and flake was also found in a pre-N.B.P. ware level at Oriup (Singh 1982:27). Manjhi (I) yielded one waste chip of stone (Singh 1982:27). At Sonpur (I) a number of fluted cores in chert were found (*I.A.R.* 1970–1:5–6). At Susipar and

Chart 34

MIDDLE GANGETIC PLAINS—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Sringaverapura*	*Sonepur*	*Chirand*	*Kakoria*	*Sohagaura*	*Kheradih*	*Taradih*	*Susipar*	*Barhagon*	*Oriup*	*Manjhi*
Ordinary Stone		Sandstone head. Chert cores, points, lunates, triangles	Quartzite, Basalt & Granite neoliths. Chert microliths					Chert, Quartz micro-liths	Chert, Quartz microliths		
Semi-Precious Stone	Carnelian flake, Jasper beads	Chalce-dony & Agate cores, points, lunates, triangles	Chalced-ony, Agate & Jasper microliths. Chalce-dony, Aga-te, Jasper, Soap-stone beads	Carne-lian, Cha-lcedony, Agate beads	Jasper & Agate beads		Carne-lian bla-de, bead	Chalce-dony, Crystal micro-liths	Chalce-dony, Crystal micro-liths		
Copper/ Bronze		wire, fragment-ary imple-ments	pieces, bead	indet-erminate pieces, ring		arrow-head	fishhook			bangle	tools
Gold	bead			ring							
Steatite			beads		beads		beads				
Shell							beads				
Ivory			objects								

Barhagon, cores, flakes, flake fragments and miscellaneous debitage in quartz, crystal and chert testify to local manufacture of microliths (*I.A.R.* 1983–4: 87).

Semi-Precious Stone: At Chirand, a number of nodules and cores of chalcedony, agate and jasper indicate local manufacture of microliths in this material (Verma 1970–1: 20). Agate and chalcedony cores were also recovered from Sonpur (I) (*I.A.R.* 1970–1: 5–6). Debitage of microlith manufacture in chalcedony was found at Susipar and Barhagon (*I.A.R.* 1983–4:87).

Beads: A very well-developed bead industry of fine steatite, red jasper, agate and soapstone is reported from the neolithic level of Chirand (Singh 1982:344). Also, at Kakoria (Misra 1981:44), beads in different stages of manufacture in chalcedony, carnelian, and agate were noted.

The Raw Materials Found Within the Sub-Region

Ordinary Stone

Mirzapur district: D.L. Drake-Brockman (1911:7) noted the occurrence of quartzite in the hilly ranges south of the Son and quartz beds and reefs in the Singnauli area.

Gorakhpur district: Montgomery Martin (1838a:522) mentioned that the only rocks in this district were of quartz which were found embedded in the banks of the Gandak and also within the river channel itself in abundant quantity.

Patna and Bhagalpur districts: The presence of large rock formations of quartz in 'the hills extending immediately west from Gidhaur in to the Sheykhpurah division' were noted by Martin (1838b:242).

Shahabad district: The hills from the Son to its western boundary, at least as far as Chandalgar, consist of a kind of sandstone (Martin 1838b: 510–11).

Semi-Precious Stone

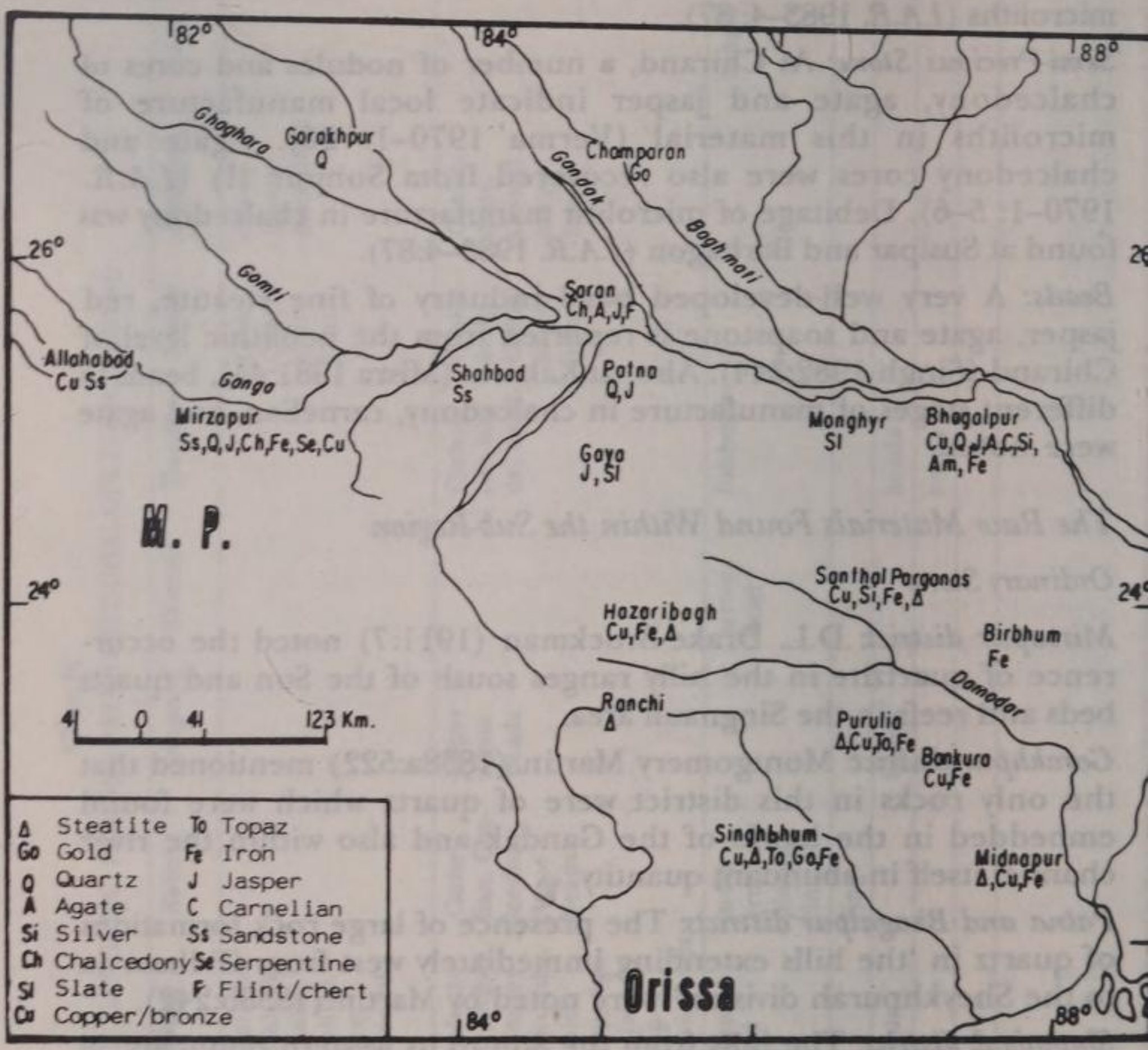
Mirzapur district: The presence of haematitic jasper and chalcedonic quartz was noted by Drake-Brockman (1911:7).

Patna and Bhagalpur districts: That jasper was an important part of the rocks of these districts was noted by Martin (1838b: 241).

Gaya district: Martin (1838:232) noted that the hills of Rajagriha especially 'the end of this cluster near Buddha Gaya consists of rude jasper red and white, which rises above the surface between the Nilajan and Mohane rivers' (Martin 1838:232).

Saran district: Verma (1970–1:20) in his preliminary report on the excavations at Chirand noted that nodules of chalcedony, agate,

Map 28



RAW MATERIALS AVAILABLE IN THE MIDDLE GANGETIC AND LOWER GANGETIC PLAINS

jasper and chert were probably collected from the bed of the Son river which is close to Chirand. Apparently, at a place known as Haldi-Chapra, where the Ganga meets the Son, pebbles of different types of stones are found which, according to Verma, may have been the source of the raw material for Chirand.

Steatite

Steatite is known to occur widely in the state of Bihar (Coggin Brown and Dey 1955:527–8):

> Soapstones and potstones abound in certain parts of Bihar although soft chloritic schists and decomposed basic rocks are often used as potstones in addition to the true talcose rocks. In the hill ranges extending along the whole of the northern boundary of Singhbhum, from the Ranchi border to the Midnapore district of West Bengal, potstones formed by the alteration of the Dalma lava and ultrabasic rocks are worked locally. Parallel with the copper belt, and stretching from east to west across Singhbhum into south-eastern Dhalbhum, there is a series of steatite and talc schist occurrences. The better of these lie in the hills north-west of Bhitar Dhari, where talc is accompanied by magnesite, while one of the large potstone deposits is situated to the west of Mahulisol, about 4 miles south-south-east of Dhalbhumgari.

Copper

The large-scale copper mineralization of the Bihar district has been briefly outlined in Chart 35.

Ivory

Francis Buchanan (1934, reprint 1986:405) noted that a few wild elephants made occasional incursions into Bihar; these incursions had been frequent and destructive in the past, especially in Nawadah.

Chart 35

COPPER MINERALIZATION IN BIHAR

District	*Places*	*Old Workings*
Singbhum	Belt stretches for 128 kms between Duarpuram in the west and Baharagora in the southeast	Ancient mine workings & slag heaps all over the belt
Bhagalpur	Baghmari, Khajuria, Bhorsar, Dudhijor, Ganaura, Karda, Chandaipatti, Rikhia-Rajdah, Kajragohra, Garbaran, Bhoga, Badladih, Bhagro-Bajra-jhilua, and Bhusi-Bhadari-Duarsar	
Hazaribagh	Golgo, Bengabad, Bishenpur, Chandio, Karkarkundar, Jhalakdiha, Ganganpur, Jhagrudih, Damgi, Aunragaro, Kurkipahari	
Santal Parganas	Belbathan, Toolsitanr, Charkipahari, Both Bandh, Panch Palar, Sankara	

The Raw Materials Available Outside the Sub-Region

VINDHYAN PLATEAU

The occurrence of chert in the Vindhyan plateau, part of which extends into the Sasaram region of Bihar is well known (see Sharma et al. 1980:102–3). The presence here of a number of semi-precious and ordinary stones as well as copper has already been noted (pp. 221–22). Furthermore, it has been pointed out by S.N. Chaturvedi (1985:106) that the chalcedony used in the lithic assemblages of the Sarayupara region is similar to that found in the proto-neolithic sites of the Vindhyan region.

EASTERN COAST

Conch shell occurrences on the eastern coast of the Indian subcontinent up to the mouth of the Godavari river have already been noted (p. 193).

Ceramic and Other Artefactual Links

The middle Gangetic plains show ceramic affinities with the upper Gangetic plains, the lower Gangetic plains and the Vindhyachal region.

At Sringaverapura (I) the red ware is said to display links with the ochre coloured pottery suggesting therefore the penetration of the latter much further east than was previously thought (Lal and Dikshit 1978–9:6). At Kausambi (I), three ceramic types have been compared with analogous types of Atranjikhera (II) (Sharma 1969:xiv). The third site which displays parallels with the upper Gangetic plains is Sarai-Mohana in Varanasi district whose pottery—the black slipped, red slipped, black-and-red ware, grey ware—in Subperiod IA is said to display parallels with Period II at Hastinapur (*I.A.R.* 1967–8:49); no details, however, have been given.

The basic distribution of the neolithic cord impressed pottery, of which a very early and important centre was the Vindhyan region and which has been outlined by S.N. Chaturvedi (1985:106) includes 'Koldihwa and Mahagara in the Allahabad district (U.P.), Lainahia and Kunjhun in the Sidhi district (M.P.), Chirand in the Saran district (Bihar), Chechar in the Vaishali district (Bihar) Susipar, Ramnagar Ghat, Gerar and Lahuradeva in the Basti district (U.P.) and Sohagaura in the Gorakhpur district (U.P.).' Although no details are available, J.N. Pal (1987:62) noted that, along with similarity in the cording pattern on the external surface of the pots, analogous pottery types to the Vindhyan cord impressed pottery are also present in the middle Gangetic neolithic culture. Similarities in the lithic assemblages of these two regions have also been noted by Chaturvedi (1985:106). The main raw material of the lithic industry

in the Sarayupara region ie., chalcedony, bears a striking resemblance to that from the excavated neolithic sites on the Belan ie., Koldihwa, Mahagara, Panchoh etc.

The black-and-red ware sites, found almost all over the region, which bear a general generic relationship with similar sites in the lower Ganga plains will be discussed in the next section.

Discussion

Different cultural segments of the middle Gangetic plains seem to have been variously oriented in terms of movements of cultural elements and raw materials. Firstly, some contact, limited in its distribution to the Varanasi and Allahabad districts, existed with the upper Gangetic doab as seen at Sringaverapura, Sarai-Mohana and marginally at Kausambi as well. Secondly, the Ghaghara-Rapti region, most significantly in the administrative divisions of Gorakhpur and Basti looked towards the peninsular region of the Vindhyas with which it seems to have shared cultural elements and from where it also procured a number of raw materials, some of which were being used by the proto-neolithic sites of the Vindhyan region itself. Thirdly, the Anga-Magadha plains as well as other districts towards the west were very much a part of the general black-and-red ware horizon which included large segments of the Gangetic plains lying in West Bengal. This interaction went right up to coast from where Taradih, in the Gaya district, procured conch shells for bead manufacture.

Lower Gangetic Plains and the Chhotanagpur Plateau

The lower Ganga plain is the vast deltaic fan lying to the south of the Rajmahal-Garo alignment and embracing an area of about 80,968 kms. From the lower Ganga and south Bihar plains, the Chhotanagpur plateau begins covering the districts of the Santhal Paraganas including the Rajmahal hills in the north, the Ranchi and Singhbhum districts in the south and the Palamau in the west (Singh and Thapan 1987:82). Stray celts in unstratified contexts in a number of districts in West Bengal and Orissa have been found—Bankura (*I.A.R.* 1956–7:69), Purulia (Chakrabarti et al. 1983:131–41), 24 Paraganas (*I.A.R.* 1960–1: 68), Midnapur (*I.A.R.* 1954–5:20; 1955–6:69; Chakrabarti and Chattopadhyay 1984), Monghyr (*I.A.R.* 1962–3:5), Singhbhum (Chakrabarti et al. 1978–9) Ganjam (*I.A.R.* 1956–7:30), Sundergarh (*I.A.R.* 1957–8:41), Dhenkanal (*I.A.R.* 1958–9:36), Keonjhar (*I.A.R.* 1958–9:38) and Mayurbhanj (*I.A.R.* 1958–9:38). However, a clear neolithic horizon is not stratigraphically marked in the Chhotanagpur plateau. The chalcolithic phase is found at a number of sites in Birbhum (*I.A.R.* 1962–3:43), Midnapur, where

the site of Basantapur flourished (Das Gupta 1964; *I.A.R.* 1961–2:59), and Bhagalpur, where Period I at Champa is chalcolithic (*I.A.R.* 1982–3:13) as well as in other areas.

The Sitewise Distribution of Raw Materials

Charts 36 a–b outline the range of raw materials used in this region. These are phyllite, basalt, sandstone, epidiorite, quartzite, dolerite, agate, steatite and copper/bronze. Chart 37 outlines the copper hoards found in Bengal, Bihar and Orissa.

The Evidence of Manufacture of Finished Products at Different Sites

Copper/Bronze: A lump of copper was recovered at Basantapur (Das Gupta 1964:35).

The Raw Materials Found Within the Sub-Region

Ordinary Stone

In both the highland regions of Orissa as well as in the Chhotanagpur plateau, most of the stones used in this period were available. The nucleus of the Chhotanagpur plateau, in fact, is made of gneissic rocks (*Imperial Gazetteer of India Provincial Series Bengal Volume 1*, 1909, reprint 1984:11). In the Rajmahal hills, the basic rocks are basaltic trap (*Imperial Gazetteer of India Provincial Series Bengal Volume 1*, 1909: 11).

Semi-Precious Stone

One of the largest original sources of cryptocrystalline silica varieties ie., agate, carnelian etc. are the lava flows of the Rajmahal traps (Coggin Brown & Dey 1955: 621).

Steatite

Coggin Brown and Dey (1955:528) mention the occurrence of steatite and potstone in the hills along the borders of Dhalbhum and Mayurbanj, in the rocks of the chromite area to the west of Chaibasa, west of Parasnath in the Hazaribagh district, in the Santal Parganas, Bhaludungri in Bonai, and in Kollaru, which is in Koraput, Orissa. The other occurrences in Orissa are at Antigam, Majjiguda and Minoraballi in Koraput district, and in the Sundergarh and Keonjhar districts (Coggin Brown and Dey 1955: 528).

Copper

Copper occurs in the following areas of West Bengal: the Purulia-Bankura shear zone, with some minor occurrences in Midnapur

Chart 36 a

LOWER GANGETIC PLAINS AND THE CHHOTANAGPUR PLATEAU—NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Kurkutia*	*Mahisdal*	*Susunia*	*Dihar*	*Singbhum Sites**	*Pandu Rajar Dhibi*	*Bharatpur*	*Basantapur*
Ordinary Stone	Phyllitic schist neoliths				Epidiorite celts, chisels, pounders, saddle querns, ringstones			
Semi-Precious Stone			Agate celt					
Steatite	beads						beads	
Copper/Bronze	celt		rods		ring, bangle, eye pencils, fish hook		objects	lump

* These sites are in the Sanjay valley near Simi (*I.A.R.*. 1962–3:6); the exact sites are not mentioned

Chart 36 b

ORISSA–NEOLITHIC-CHALCOLITHIC PERIOD

Raw Material	*Harichandipur*	*Sardapur*	*Kaniha*	*Silipurji*	*Muruda*	*Dangil Pasi*	*Jaipur*	*Patwa*
Ordinary Stone	Phyllite celt. Epidiorite chisels. Quartzite ringstone	Epidiorite chisels. Dolerite chisel. Sandstone chisel	Basalt chisels. Quartzite ringstone	Quartz-phyllite tool	Quatz-chlorite tool	Sandstone celt	Epidiorite tools	Epidiorite tool

Chart 37

COPPER HOARDS IN BIHAR, BENGAL AND ORISSA

Place	*District*	*Objects*	*Place*	*District*	*Objects*
Andheri	Singhbhum	celts	Bandua	Ranchi	celt
Bargunda	Hazaribagh	celt, ring	Bartola	Ranchi	celts
Bichua	Ranchi	celt	Bordogaon	Singhbhum	celts
Chadsai	Santal Parganas	celts	Dargamma	Ranchi	celts
Hami	Palamau	celts	Kaharbari	Hazaribagh	celts
Kamdera	Hazaribagh	celts	Kaushaya	Monghyr	celt
Kera	Singhbhum	celt	Kolabarty	Dhanbad	celt
Caguna	Palamau	celt, anthropomorph	Chatla	Manbhum	celt
Tamajuri	Midnapur	celt	Bhanga pir	Mayurbhanj	celt, axes
Dhunira	Pal Lahara	celts	Agavibani	Midnapur	celt, ring
Parihati	Midnapur	celt, axes	Bhaktabandh	Bankura	celts
Khiching	Mayurbhanj	celts	Kshetra	Mayurbhanj	celts

and Bankura districts (Raghunandan et al 1981:174). In the Bankura district, Chakrabarti et al. (1985–6:67) noticed two old mines at Chhedapather and the other at Tamkum. There are also some mineralized belts in the state of Orissa. Firstly, the Singhbhum shear zone continues beneath the alluvial tract of the Subarnarekha river to Kusumbari-Kesarpur in the Mayurbhanj district (Raghunandan et al. 1981:165). Another important mineralized belt recognized in recent years is the Sargipalli shear zone in the Gangpur basin (Raghunandan et al. 1981: 165).

The Raw Materials Available Outside the Sub-Region

All the raw materials seem to have been available within the ambit of the sub-region itself.

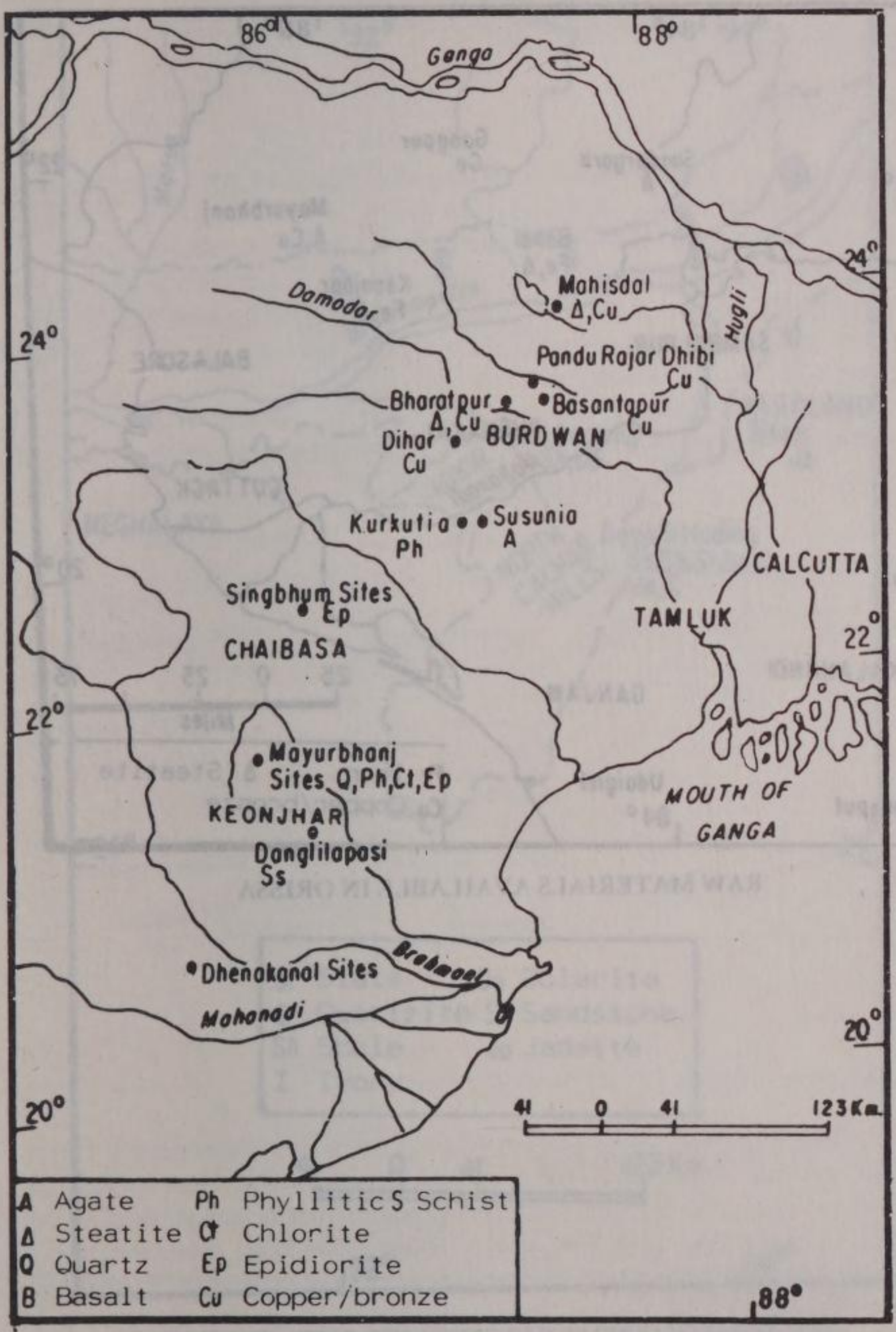
Ceramic and Other Artefactual Links

The black-and-red ware pottery which is the type fossil of the protohistoric sites of this region displays significant similarities with the black-and-red wares of the middle Ganga plain.

Discussion

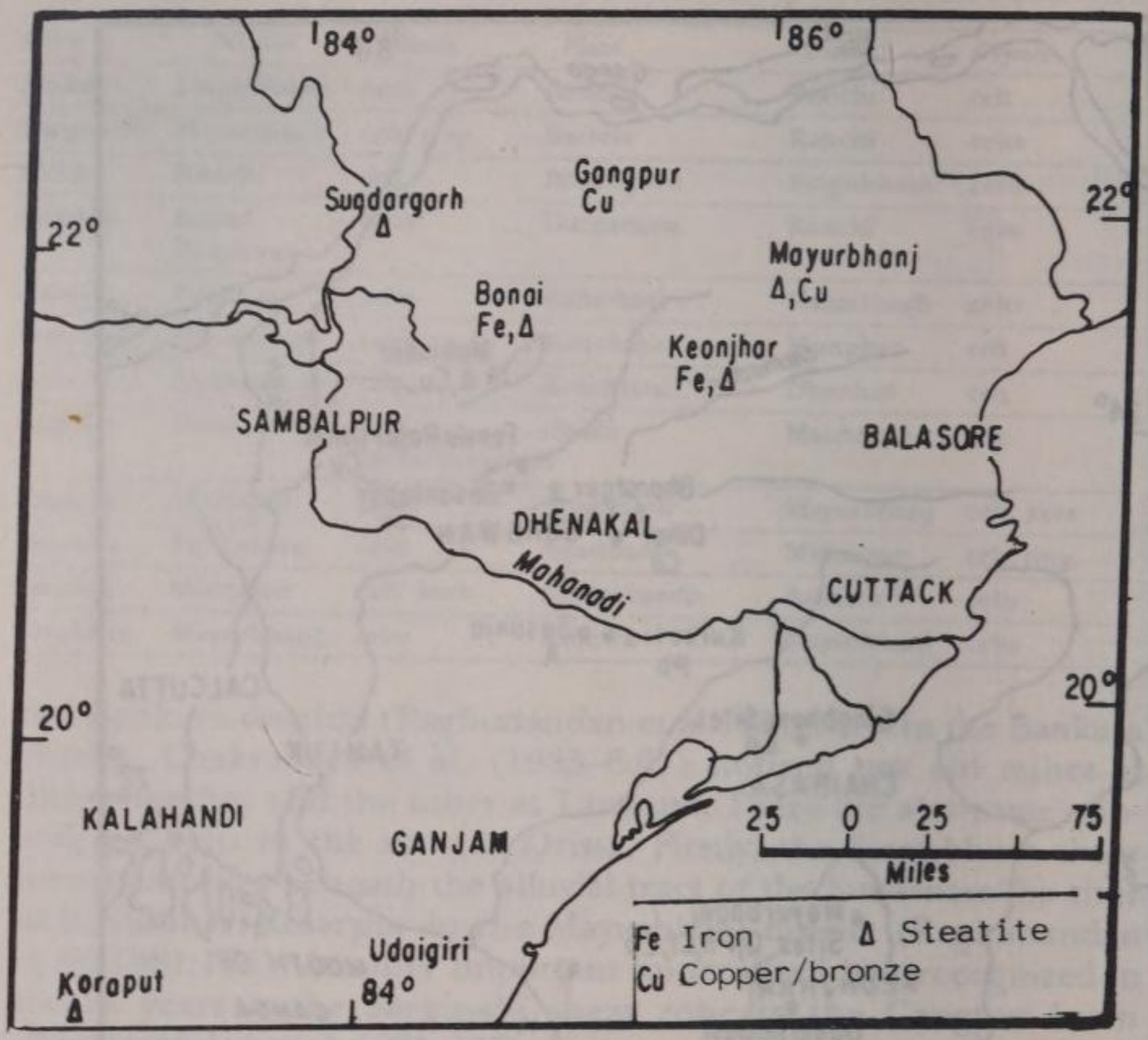
The neolithic stratum is uncertain in West Bengal and, even in Kuchai in Orissa, does not display any significant archaeological links with contemporary neolithic cultures in neighbouring subregions. The raw materials also seem to have been available locally. In the subsequent chalcolithic stage, however, the lower Ganga

Map 29



NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE LOWER GANGETIC PLAIN AND THE CHHOTA-NAGPUR PLATEAU

Map 30



RAW MATERIALS AVAILABLE IN ORISSA

Map 31

NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDE THE HARAPPAN ORBIT-SITEWISE DISTRIBUTION OF RAW MATERIALS IN NORTH-EAST INDIA

plains became significantly integrated with the black-and-red ware horizon of the middle Gangetic doab, although the resource base of the sub-region continued to provide the basic raw materials exploited by these sites

North-East India

Although this is a large area covering the states of Manipur, Assam, Nagaland, Meghalaya, Mizoram, Tripura and Arunachal Pradesh not much is known about the sequence of the protohistoric cultures there, their chronology or their links, if any, with the other contemporary cultures of the subcontinent. (cf. Lahiri 1991). The basic raw materials that were used in this sub-region, as a reading of Chart 38 would show, are: shale, slate, dolerite, sandstone, quartzite, slate, jadeite and ivory. These were locally available. The only non-local raw material was jadeite, which was probably from Burma.

Chart 38

NORTH-EAST INDIA–NEOLITHIC-CHALCOLITHIC PERIOD

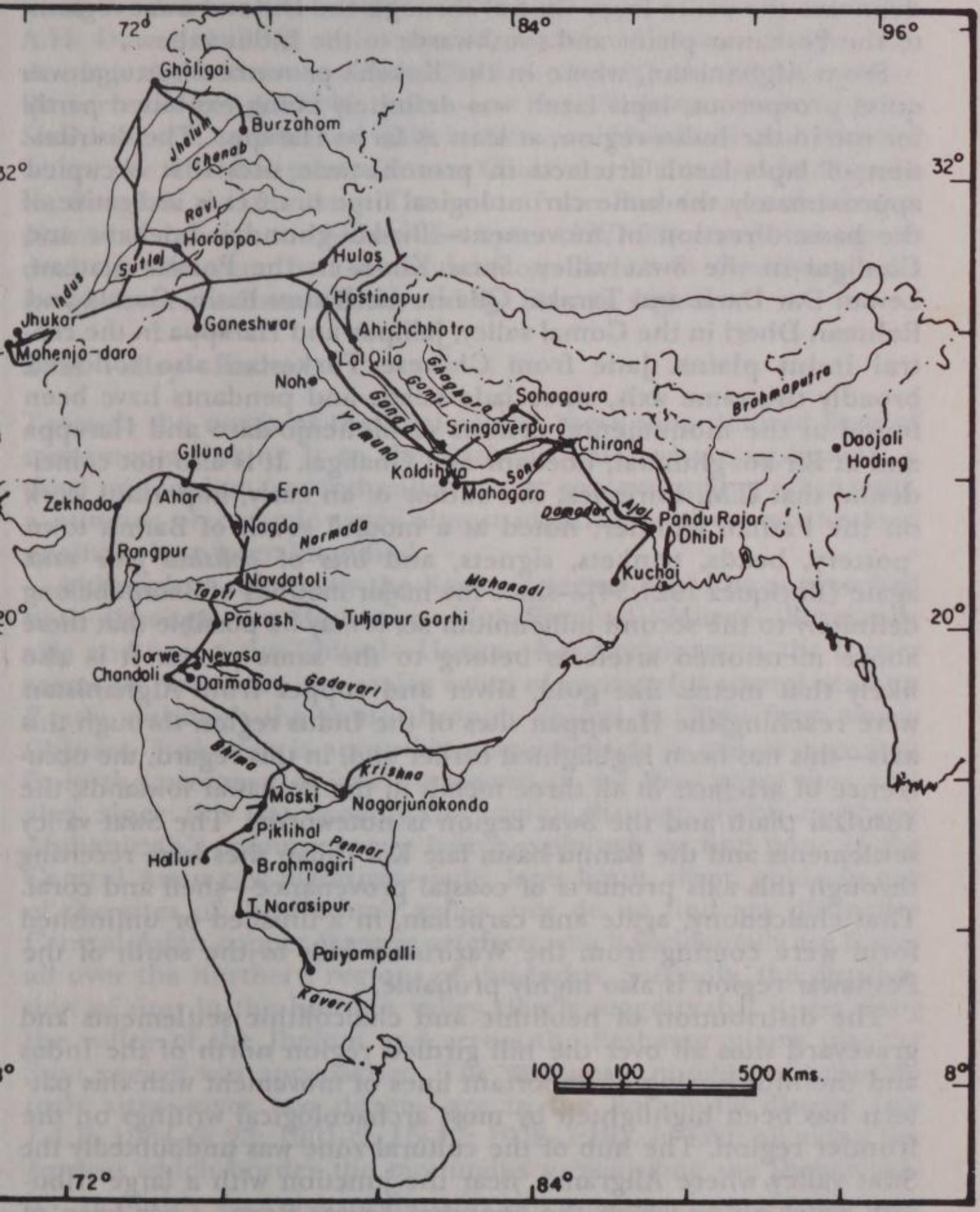
Raw Material	*Karbi Anglong*	*Daojali Hading*	*Nagaland Sites*
Ordinary Stone	Shale axe. Dolerite chisel	Sandstone celts, edge ground tools, grinding stones and querns. Shale celts, chisels, axes. Slate axes. Dolerite adzes. Quartzite pebble mullers	
Semi-Precious Stone		Jadeite axe	Jadeite tools
Ivory		fragments	

INTERNAL TRADE ROUTES

Indus Plains—North West Frontier Province

A very significant trade route operated in a third-second millennium BC context from the Indus plains through the Gomal-Bannu-Kohat-Peshawar axis to the tangled mass of mountains and valley pockets of the Swat and Dir areas. Culturally, the importance of this route lay in its role as the main channel through which the monumental centres of the Indus civilization in the Punjab and Sind, and other contemporary sites in the Derajat, Bannu and Taxila regions came to procure resources such as jade, lapis lazuli, silver, gold and copper. The passes through which the Hindu Kush mountains were traversed to reach remote regions in Turkestan and

Map 32



INTERNAL TRADE ROUTES IN THE CONTEXT OF THE NEOLITHIC-CHALCOLITHIC CULTURES OUTSIDF THE HARAPPAN ORBIT

Badakshan will be discussed in the section on the external routes of communication. For the present purposes we propose only to delineate the route from Chitral through the Dir and Swat regions to the Peshawar plains and southwards to the Indus valley.

From Afghanistan, where in the Kokcha province Shortugai was quite prosperous, lapis lazuli was definitely being exploited partly for use in the Indus region, at least as far as Harappa. The distribution of lapis lazuli artefacts in protohistoric sites that occupied approximately the same chronological time bracket is indicative of the basic direction of movement—Bir-kot-ghundai, Loebanr and Ghaligai in the Swat valley, Sarai Khola in the Potwar plateau, Lewan Dar Dariz and Tarakai Qila in the Bannu basin, Gumla and Rehman Dheri in the Gomal valley, Jalilpur and Harappa in the central Indus plains. Jade from Chinese Turkestan also followed broadly the same axis, since jade beads and pendants have been found at the monumental centres of Mohenjo-daro and Harappa and at Bir-kot-ghundai, Loebanr and Ghaligai. It is also not coincidental that C.M. Enriquez, the author of an early, important work on the Pathan frontier, noted at a mound south of Bannu town 'pottery, beads, trinkets, signets, and bits of *polished jade* and agate' (Enriquez 1921:54)—since the major mounds of Bannu belong definitely to the second millennium BC, it may be possible that these above mentioned artefacts belong to the same phase. It is also likely that metals like gold, silver and copper from Afghanistan were reaching the Harappan sites of the Indus region through this axis—this has been highlighted earlier and, in this regard, the occurrence of artefacts in all three metals in the Peshawar lowlands, the Yusufzai plain and the Swat region is noteworthy. The Swat valley settlements and the Bannu basin late Kot Dijian sites were receiving through this axis products of coastal provenance—shell and coral. That chalcedony, agate and carnelian, in a finished or unfinished form were coming from the Waziristan hills to the south of the Peshawar region is also highly probable.

The distribution of neolithic and chalcolithic settlements and graveyard sites all over the hill girdled region north of the Indus and the interleaving of important lines of movement with this pattern has been highlighted by most archaeological writings on the frontier region. The hub of the cultural zone was undoubtedly the Swat valley where Aligrama 'near the junction with a large tributary valley along which the Shahderi Khwar flows. . .has been of primary importance as it provides easy communication with the adjoining Panjkora valley in the Dir district, the centre of the Gandhara Grave culture' (Tusa 1979:675–80). Through the Dir region, Chitral was accessible where, at a cemetery at Tamunak, the motif incised on a rim of a vase—which is part of the repertoire

of motifs on the fine grey ware of Loebanr, Katelai and Butkara (Period I), suggests the links between these valleys. The routes from the Swat valley to the Peshawar plain have been outlined by A.H. Dani (1967:12) : (i) over the Malakand pass to Dargai, (ii) through the eastern end from Barikot, through the Karakar pass—Buner valley—Ambela pass—to the Sudama plain where Shahbazgarhi stands and (iii) in between Malakand and Karakar where the Shahkot pass connects Chakdara, Thana and Jamalgarhi via Sanghav and Katlang. The route from Peshawar to the Indus plains lay through the Kohat—Enriquez (1921:93) noted that a good deal of salt went by this route from Kohat to Peshawar—and lower down the Bannu basin and the Derajat region.

Swat Valley—Kashmir

Towards the north of the Swat region there were definite lines of movements linking it to the Kashmir valley where in broadly a third millennium/second millenium BC context, among other traits, a number of ceramic types almost identical to those of the Swat neolithic have been identified.

Although theoretically the Kashmir region could be approached both through the Peshawar—Muzaffarabad—Muree—Baramulla axis and across the Chitral—Hunza—Karakoram route, the former seems to have been the major route of contact for several reasons. Firstly, although the route through Chitral to Gilgit from where Chinese Turkestan is accessible, was definitely in use–as is evident from the presence of jade ornaments in the Swat valley sites, and also, since this was broadly the region through which northern Afghanistan's resources were being exploited, we find none of the Central Asian raw materials—jade, lapis lazuli, silver, gold—in any of the sites of the Kashmir valley, nor do we find any distinctive Central Asian copper/bronze artefacts which incidentally are found all over the northern regions of the Indus. Secondly, the distribution of sites in the Kashmir valley clearly suggests that it was along the valley of the Jhelum and across the Peshawar plains that the Swat region was approached. The maximum number of protohistoric sites—over two dozen—are in the Baramulla district (see *I.A.R.* 1984–5: 23; 1981–2: 16–17; 1976–7:19). In fact, all along the *karewas* which border the mountains surrounding the Jhelum valley, neolithic sites sharing broadly the same artefactual traits were located. From the Baramulla-Srinagar route, along which the river is navigable, Burzahom, a major settlement of this period, was reached. The other line of communication from Baramulla through Pulwama towards Anantnag was equally significant—Gufkral and Shahpendu are located in the Pulwama district while in the Anantnag district, along a distance of 48 km from Anantnag to

Pampur as many as nine sites with neolithic assemblages containing gritty red ware and burnished wares (ceramic types found in the Swat valley) are found (*I.A.R.* 1962–3: 9). Thirdly, this was the only axis through which whatever limited contact (whether in the form of exploitation of raw materials or in the presence of certain pre-Harappan and Indus-inspired artefacts) between Burzahom and Gufkral and the Harappan civilization could have been mediated. That the Swat region also interacted with Kashmir along this line is, therefore, quite logical.

The outline of this route is available in a number of works (Knight 1894:6–12; Prinsep 1st print 1876, reprint. 1979:200–19; Raina 1977:199). From Rawalpindi, the Muree hills, which are about 39 miles from there were reached, to go on to Kohala, Dulai (40 miles from Murree), and Domel. From Domel, the Uri gorge was traversed to reach Baramulla. Incidentally, it is only from Baramulla onwards that the Jhelum river is navigable.

Sind—Rajasthan

The importance of the Cholistan tract in mediating traffic, of which the most important element was Rajputana copper, between Sind and the Ganeshwar-Jodhpura complex in north-east Rajasthan has been discussed in detail in the previous chapter. The basic evidence in this regard is the occurrence of some Harappan pottery in north-east Rajasthan, the presence of Indus writing at Sabania, as well as general similarities in copper/bronze artefacts of the two regions, among other elements. To summarize the basic conclusions, most of the routes from north-east Rajasthan, whether riverine or overland, came out into the Ghaggar-Hakra region around the Sothi-Bhadra-Kalibangan area. The Bikaner-Pugal route may also have been a caravan track.

Additionally, we would like to mention that the Indus plains and Bahawalpur seem to have enjoyed significant contacts in Rajasthan basically with the Ganeshwar—Jodhpura complex. The whole orientation of the latter culture was towards the regions to its north-east and north-west, and significantly, it displayed hardly any contact with the Ahar cultural complex of south-east Rajasthan. Although several similarities have been pointed out by R.C. Agrawala, among others, between the copper-bronze artefacts of the two regions, they are of a very general nature. What is more important, in our opinion, is that not a single sherd of the Ganeshwar O.C.P. pottery and vice versa the white painted black-and-red ware of the Banas basin has been found in south-east Rajasthan and north-east Rajasthan respectively. The Ahar culture was, on the other hand, oriented towards Gujarat and Malwa.

Whatever Harappan elements are present in the Ahar cultural complex came from Gujarat.

Rajasthan—Gujarat

Although there are a large number of routes and feeder routes that connect these two regions (see Sharma 1985:162–4), in the protohistoric period, there were two significant lines of movement. Firstly, a route went from Udaipur through Dungarpur to Idar, from where the bordering districts of Gujarat were reached, going right till the coast. The concentration of sites of the Ahar culture in the Bhilwara and Dungarpur districts, of which Ojyana, in the Asind tehsil of Bhilwara district, yielded some Indus ceramic elements, is suggestive of interaction along this route. Among the artefactual categories common to the two regions, the element that has been highlighted by the excavators of Ahar as providing indisputable evidence of contact between Gujarat and Rajasthan is the presence at Ahar, in more than a marginal quantity, of the late/post-Harappan Lustrous Red Ware, with typical designs and shapes. In addition to this, the etched carnelian beads at Ahar, which in any protohistoric context are most likely of Harappan provenance or inspiration, and one lapis lazuli bead, could also have formed a part of the general traffic from Gujarat, where at Lothal and Zekhada (which, incidentally, is located along this general axis) lapis lazuli beads were recovered. Sea shells, which were manufactured into artefacts at Ahar, were also of coastal origin.

This, incidentally, was a well-frequented highway in the medieval period. Abul Fazl is supposed to have mentioned that Raja Man Singh, in his journey from Gujarat, came by way of Idar to Dungarpur and reached Gogunda, near Udaipur (cited in Sharma 1985:162). Malcolm's *A Memoir of Central India*, Volume 1 (1823, reprint 1970:177–78) also noted the strategic importance of the province of 'Bagur' (ie., *Bagar*; see Fig. 108 in Spate 1964:567): 'the roads through it leading by Doongurhpoor and Lunawarra into Guzerat, are good, and much frequented. . . .'

The second line of movement between Gujarat and Rajasthan was mediated by Malwa and is discussed below since elements of the Malwa chalcolithic also seem to have followed the same alignment into Rajasthan.

Rajasthan—Malwa—Gujarat

A significant communication line from Gujarat went across Malwa, crossing the Narmada to reach Ujjain. From Ujjain there were probably several feeder routes to northern Malwa and Rajasthan: (i) one across to Gwalior and Morena districts, (ii) another across

the north-western pleateau ie., the Mandasor district through which south-east Rajasthan was accessible, and (iii) a route, crossing the Chambal at Kota from where Chittorgarh was reached. In the period under discussion, traits of the Malwa and Gujarat neolithic-chalcolithic cultures were disseminated through these lines and conversely, elements of the Ahar culture reached Central India.

The direct line of movement from Gujarat to Malwa passed through the *rath* region whose significance as a communicating link has been highlighted by Malcolm (1823:16): 'from the Vindhya range on the Western extremity of Nemaur, there extends North a hilly tract separating Malwa from Guzerat, whose geographical breadth is from 50 to 70 miles, and which is terminated by the southern and western boundaries of Mewar. . . . There are several well-frequented roads through this province, connecting Malwa with Guzerat.' The central Malwa pleateau, in fact, was the point at which the route from Gujarat turned north for Rajasthan.

The diffusion of late/post Harappan cultural traits from Gujarat took place along this axis, concentrating in the Ujjain and Morena districts. At Dangwada in the Ujjain district, in Period IA Lustrous Red Ware was recovered and in the Morena district, along the Kunwari and Asan rivers, which are parts of the Chambal river system, a number of late Harappan sites have been found (*I.A.R.* 1981–2:31–2). The presence of Malwa fabrics at sites on the Chambal and Sipra rivers in the Morena district implies the presence of a corridor there through which Central Indian traits reached the Chambal river system. In fact, from the Ujjain district, a route crossed the Chambal to reach Kota from where Chittorgarh was accessible. The Vindhyan plateau notwithstanding, this direction of movement seems to have been used among others by the Marathas, once they had established their power over Malwa, as a springboard for their attacks on Rajasthan (Sinh 1936:328). Contacts between Malwa—Rajasthan along this route can be postulated on the basis of the presence of sherds of Malwa ware in the region of transit ie., the Kota district (*I.A.R.* 1981–2:31–3). Also, the occurrence at Kunjhun, Sidhi district, of a few sherds of Malwa ware (*I.A.R.* 1981–2:44) reveals some kind of contact with the Vindhyan plateau.

A section of central Malwa, ie., Ujjain and Shajapur, has yielded significant evidence of intimate contact with Rajasthan in the form of Ahar pottery, with a distinct Ahar cultural level at Kayatha. The route to Rajasthan from here definitely went through to the north-west plateau to Dungarpur and Udaipur. Nineteenth century accounts have stressed the significance of the region bordering Malwa and Rajasthan in the north-west. Malcolm (1823:18–19), for instance, noted the importance of 'Kantula a small district. . .lying between Bagur and Mewar, and extending westwards from

Mundissor to the Banswarra and Odeypoor territories. . . . Roads to Guzerat, Kattyar, and Cutch, lead through this province. . .' The Madhya Pradesh district of Mandasor and, at least, a section of Ratlam which are located in this region in fact have several aspects in common with the adjoining areas of the Udaipur state (Patil 1952:6). In the protohistoric period, two sites in the Mandasor district that have yielded Ahar wares, along with Malwa pottery, clearly underline the antiquity of such common elements. A number of sites with Ahar cultural elements are also located in the Shajapur district which is in broadly the same region. The basic movement of the Ahar culture 'from the south-west to the north-east up the course of the Berach and Banas' (Misra 1967:207) and the presence of sites in the Udaipur and Chittorgarh districts with prolific artifactual repertoires, also suggest that cultural traits percolating from Gujarat and Malwa may have been disseminated in the Ahar cultural zone through the Udaipur—Chittorgarh area.

Malwa—Maharashtra—Gujarat

The antiquity of this direction of movement goes back to possibly a third millennium BC context, testified to by the occurrence of Kayatha ware at Kaothe, in the central Tapti basin. In the late/post Harappan context, among other things, the presence of Lustrous Red Ware in large segments of Maharashtra and Malwa suggests a significant zone of interaction and expansion along this axis. These links were further consolidated in the subsequent cultural phase when full-fledged Malwa cultural levels were often found. By the Jorwe phase, however, this route was eclipsed by the interaction of Maharashtra with Karnataka.

A study of the lines of communication connecting the three segments of this interaction zone has to be qualified by an awareness of certain geographical factors peculiar to these regions. Firstly, large parts of the Malwa and Maharashtra plateaux are very hilly and can be crossed at various points. James M. Campbell's (1880:565) observation in this context is worth quoting: 'Of ninety-four passes through the hilly country to the west, north and south of Khandesh, fifteen are in the Sahayadris, fifty-four in the Satpudas, and twenty-five in the Satmalas. Of the fifteen Sahyadri passes, seven are in the range separating the Timpalner subdivision from the Dangs and the Nasik district, and nine are in the spurs that intersect the Pimpalner subdivision.'

Therefore, it is not really feasible to exactly pinpoint in the Deccan—Malwa region where routes actually passed or the exact pass that was used in traversing any given sub-region. Secondly, neither of the two major rivers, the Tapti or the Narbada, is navigable. The bed of the Tapti river is only navigable for twenty miles

from the sea (*The Imperial Gazetteer of India* Vol. XXIII 1908:247). The Narbada river bed is also, at intervals of every few miles, crossed by diagonal ridges and is 'useless for navigation except for country boats between August and February, save in the last part of its course, where it is navigable by vessels of 70 tons burden up the city of Broach, 30 miles from its mouth' (T*he Imperial Gazetteer of India* Vol. XXVII 1908:376). At the same time, they are both fordable at various points. Thirdly, in the western Maharashtra plateau (the districts of Nasik, Ahmednagar, Poona, Sholapur, Sangli, Kolhapur, and parts of Buldhana) there is a strong orientation in the settlement pattern to water points and routeways, the dominance of one or the other varying from area to area (Countenho and Ramamurthy 1942:38). We can only guess that in the period under discussion, many sites which have stream bank and route locations, may be a reflection of the importance of transit trade carried through this region.

The major trade route seems to have emanated from the Narmada valley where Navdatoli, located on an ancient crossing of the river, was of strategic importance in providing access to the Khandwa gap, the low watershed between the Narmada and Tapti valleys, which is the nly major break in the Satpuras. This corridor in fact, till today, is the thoroughfare through which communication flows from Malwa to south and south-western India (cf. Shrivastav 1969:224). Going through the old East Khandesh district where Bahal was located, the route went through the Poona and Nasik regions to the Dhulia district from where Surat was accessible. Interaction along this route goes back to the late Harappan period as the recent discovery of late Harappan-related ware of the central Tapti basin at Navdatoli suggests. The presence of a number of marine varieties of shell at Maheshwar and Navdatoli and their procurement for local manufacture, as well as the occurrence of coral there are indicative of the movement of resources from Gujarat. Shell artefacts also occur at other sites like Prakash, Chandoli and Nevasa along this route. In addition, Lustrous Red Ware of a late/post Harappan tradition and Malwa ware are found all along the route—at Bahal in East Khandesh, at Theur, Walki, Chandoli and Inamgaon in the Poona district, at Nasik, at Sarangkheda, Prakash, Kaothe and other related settlements in the Dhule district and at Jokha, Chawaneshwar and other sites in the Surat and Broach districts (see *I.A.R.* 1957–8:15–17). The occurrence of Jorwe-type painted designs at Pipliya Lorka in Raisen district testifies to the linkages going right upto the Vidisha region from where undoubtedly stray elements of that culture reached Ahar. Lapis lazuli beads at Navdatoli may also have reached through this route. Francois Martin (1974–81; Varadarajan 1981), in his memoirs,

met two Pathan merchants as well as a Pathan cavalier in his journey through Aurangabad and Dhulia districts to Surat. It is likely that lapis from the north-west reached central India in similar circumstances.

Another major route went across from coastal Gujarat through Dhule district to Ahmednagar and Aurangabad. The presence of shell at Nevasa and Daimabad (Malwa phase) in the Ahmadnagar district points to coastal contact. Furthermore, the Ahmadnagar—Poona route, along which were located sites with Malwa and Jorwe wares, was also the line that connected the district with almost all the districts of southern Maharashtra such as Satara, Kolhapur and Ratnagiri from where raw materials such as copper could have been procured. At Apegaon, in the Paithan taluka of Aurangabad district, Malwa ware is present which suggests that this region was an important point along which central Indian-Maharashtra trade and other traffic passed since the beginning of settled life there.

We may also note that a feeder route went from the Narmada valley to the Vidarbha region where Tuljapur Garhi was located—the main pottery of Phase A is of Malwa Ware. Links with the Maharashtra plateau are to be seen in the form of a Jorwe level in the subsequent phase there. The major route in 1911 from Amravati to the Nimar district came 'through Balagon jagir and Assegaon to Ellichpur and Paratwadi and on thence into Melghat and Ghatang, Sembadoh and Dharni debouching into Nimar at Dhertalai, a distance in all of 98 miles' (Fitzgerald and Nelson 1911, reprint 1985:225).

Maharashtra—Karnataka—Andhra Pradesh—Tamil Nadu

The importance of the Maharashtra—Karnataka zone of interaction, flourishing in a second—first millennium BC context is well understood. The linkages between these two regions have been explained by Dhavalikar in terms of the actúal physical migration of peoples from Karnataka towards regions to the north, although doubts have been expressed about this interpretation (cf. Paddayya 1973). The transmission of trade items and cultural elements from north *Maidan* was through the southern plateau. The southern plateau, in turn, was mediating routes to Tamil Nadu. From the Raichur and Bellary districts, as well as from the Gulbarga region, routes went across to Andhra Pradesh.

Artefacts and cultural elements of Maharashtra provenance went across the bordering districts through Karnataka to the Mysore district as well as towards the east into Andhra Pradesh, especially the Kurnool district. This is obvious from the presence of the following artefactual categories: (i) the presence of fabrics

comparable to the Savalda ware at five sites in Belgaum, Bijāpur and Shimoga districts; (ii) in addition to general ceramic similarities with Jorwe forms etc. Jorwe ware has been found at a number of sites in the Bijapur, Bidar, Gulbarga, Bellary, Raichur, Chitaldrug, and Dharwar districts of north Karnataka. In south Karnataka, T. Narasipur also yielded a Jorwe-like ware; (iii) the coarse grey ware of Bahal and Nevasa corresponds very closely with similar specimens from Brahmagiri and Hallur; (iv) various stone tools in Maharashtra bear a close resemblance to those from sites in the Karnataka plateau. For instance, the polished stone axes at Nevasa resemble those from Brahmagiri, while the edge tools from Songaon are of a south Indian type (v) the occurrence of a black-and-red ware in the late Jorwe phase of Inamgaon that bears a close resemblance to that found in the megalithic complexes in Andhra, Karnataka and Tamil Nadu. In addition to these common artefactual attributes, gold, serpentine as well as possibly some copper were reaching Maharashtra.

In the interaction between these regions the districts of Belgaum, Bijapur, Bidar and Gulbarga formed the transitional zone along which trade and other cultural elements were transmitted. The importance of the Shorapur Doab, in this context, has been underlined by Paddayya (1973:85):

> The Shorapur Doab and the Bijapur district form part of a narrow belt of land running south-west—north-east between the Belgaum and Bidar districts—It is along this belt that the cultural traditions of Maharashtra—language, food habits etc.,overlap with those of the Karnataka plateau. From both geographical and cultural points of view this zone forms a transitional zone between the upper and lower parts of the Deccan peninsula.

This zone is contiguous to the core region of the Karnataka plateau and to Andhra Pradesh. One of the routes that followed into the Raichur district where Maski and Piklihal, among other sites, were located was clearly outlined by Allchin (1960:1–2): 'This route passes Shahpur in the Gulbarga district, famous since Meadows Taylor's time for its Megalithic 'tumulus' and other remains; it reaches the Krishna south of Tathni where an ancient settlement guarded the river crossing. Climbing the long hill from Tathni one reaches the medieval *samasthan* of Gurgunta and one proceeds south-westwards towards Lingsugur . . . . At Linsugur the road forks, the eastern branch turning away towards Maski and Bellary.' Going through to Bellary, the large number of sites displaying contacts with the Maharashtra plateau and concentrated around the Tungabhadra river testify to the alignment of the route. The Tungabhadra river, incidentally, is not navigable but, with the exception of the rainy season, is usually fordable (Francis 1904:7). In addition there were about fifty ferries across the river, and the

Bellary District Gazetteer (Francis 1904:118) informs us that, judging from the bids made in the auctions of the ferries, the ferry at Kampli in Hospet taluk in the early part of this century was the most frequented in the district, while those at Talarigattu (between Hampi and Anegundi), at Siruguppa in Bellary taluk, and near the ruins at Modalaikatti in Hadagalli taluk came next. Also, in the rainy season the Tungabhadra used be crossed in 'circular basket boats from eight to twelve feet in diameter made of split bamboo wicker-work and covered with hides' (Francis 1904:7).

The routes to Andhra Pradesh may have been mediated by north Karnataka, although the possibility of a separate route from the Bidar district to north-western Andhra Pradesh is a distinct possibility. We are postulating the presence of such a separate axis on the basis of certain ceramic types that are present in Andhra Pradesh, but are missing in Karnataka. These include (i) the presence of Lustrous Red ware types and other ceramic similarities with the post-Harappan tradition of Gujarat in the Kurnool district; (ii) the presence of certain characteristics in Andhra Pradesh of the Chandoli and Navdatoli chalcolithic traditions such as the Black-and-Grey/Black-and-red ware, the plain coarse Red and Brown ware. A large number of neolithic sites in Karimnagar are located in an area contiguous to the Bidar district and may have mediated traffic between Andhra Pradesh and Maharashtra, Malwa and Gujarat.

Coming back to north Karnataka, from here routes went over to south Karnataka and further on to Tamil Nadu. The discussions available on routes in the travel literature and some of the old gazetteers of the Karnataka and Mysore regions (cf. Buchanan 1807) clearly suggest that there were large numbers of combinations and permutations through which regions were interacting with each other. Scott's *Routes in the Peninsula of India*, in which the movements of the Madras army were recorded most meticulously by its former quarter master general, discusses in detail the variety of routes which connected different points. For instance, among the various routes connecting Bangalore and Bellary were the following two: (a) one via Chota Balapoor, Guntwarpully, Cogirra, Rampooram and Honoor and (b) by Toomcoor, Seerah, Pursarampooram and Ryadroog (Scott 1853:40–2). From the south Karnataka region interaction across to the North Arcot, Salem and Dharampuri districts was through the south-east of the old Mysore state.

The evidence of interaction along this route lies basically in the occurrence of a large number of neolithic sites in the Mysore district, including T. Narasipur, which display a striking similarity in the wares and shapes of neolithic Hallur. Further down, at least

thirty ceramic similarities have been noted between the Tamil Nadu neolithic sites and Piklihal. The neolithic culture of Tamil Nadu, according to Narasimhaiah, however is close to that of T. Narasipur and Nagarjunakonda.

The discovery of neolithic sites in north and south Kanara (*I.A.R.* 1968–9:24), with wares similar to the Maski fabric suggests that a communication line went across the Sahyadri mountains on to the west coast. Conch shell and coral occurrences at a number of sites in the *Maidan*—Tekkalakota, Hallur, Maski, Piklihal and Sanganakallu—seem to suggest this.

Shell artefacts, made from species of marine origin, found in Guntur (Nagarjunakonda), Kurnool (Ramapuram) and Manbubnagar (Chinnamarur) districts suggest east coast contact. The preliminary report on Veerapuram (Sastri et al. 1984:1) suggests that this site in Kurnool gave access to the coastal regions of Andhra Pradesh across the Srisailam hills. The distribution of neolithic sites in the Vishakapatnam and Srikakulam region also suggests links with the coast.

Punjab Plains—Upper Gangetic Plains

The significance of the communication between the Ambala and Karnal axis and the Saharanpur district has already been noted in the context of the distribution of late Harappan sites. The presence of O.C.P. sites in the Karnal and Ambala districts such as Manakajra and Kharwan (Bhan and Shaffer 1978: 62) and as many as 88 O.C.P. sites in the Saharanpur district testifies to its continuing importance. A route also went across the Jamuna from the Punjab plains to Meerut district where, in addition to Hastinapura, seven other sites were located and up to Muzaffarnagar where three O.C.P. sites were found. We also feel that semi-precious stone artefacts—an agate bead at Gadhrona, a carnelian bead at Ambkheri and a chert blade at Bargaon, could have possibly reached these sites from the Harappan distribution area in east Punjab where they are known to widely occur, and where Dher Majra continued to flourish as a bead manufacturing centre in the late Harappan period. Whatever Harappan traits are found in the Upper Gangetic plains, such as the etched carnelian bead at Atranjikhera in the Etah district or pottery types at Ahichhatra in the Bareilly district, travelled along this axis.

Upper Gangetic Plains—U.P. Himalayas

The postulation of contacts between these two regions is based on the presence of a large number of copper/bronze artefacts, found often in the form of hoards, as well as stone objects in a mineral poor region like the upper Gangetic plains, and the availability of

these resources in the contiguous regions of the Uttar Pradesh Himalayas. In this regard, the distribution of a large number of copper hoards in Saharanpur, Shahjahanpur, Hardoi and Bijnor ie., in the northern districts of Uttar Pradesh is significant.

Garhwal could have been approached by a number of routes, a discussion of which is available in the 1910 edition of the British Garhwal gazetteer (Walton 1910: 48ff; also see Nautiyal 1969:6). Also useful, for the reconstruction of these routes, is the migration pattern of the Dudh Gujjar, a pastoral community who even today camp in the reserve forests of the sub-Himalayan terai and the Siwalik ranges in the districts of Dehradun and Saharanpur and migrate in summer to the high altitude pastures in the Himalayas (Negi 1982: 43). These routes, incidentally, are more or less fixed routes, and in the map prepared by B.S. Negi the two migration routes followed by the Gujjars are clear: (i) one going through Dehradun to Chakrata and Uttarkashi and (ii) another route following the Ganga river all the way to Badrinath. From this route, were routes going off to Kedarnath and Uttarkashi. That the Saharanpur district was interacting with Garhwal along the Ganga is very likely since an O.C.P site was found at Mayapur in Hardwar (*I.A.R.* 1965–6: 43). In this context, it is interesting to note that Walton (1910:50) mentioned a route from the lower stretch of the pilgrim road between Byansghat and Lakshmanjhula and then through Rishikesh to Hardwar and Saharanpur. From Bijnor, where copperhoards and O.C.P. sites have been found, a route may also have gone to Garhwal following possibly the alignment which used to go from Najibabad to Kotdwara (Nevill 1928:90). From here it went to Dogadda, up the Khoh river to Dadamandi, ascending the Languar range to reach Banghat (Walton 1910:48). After reaching Pauri, two routes could be used to reach Karanprayag: (i) one, used by travellers with animals, descended into the Ganges valley and continued along the Ganges river to Karanprayag; (ii) if load was being personally carried, a road along the ridge which went past Khirsu, Bhainswara and the Dhanpur copper mines was used to get to Karanprayag via Chatwapipal (Walton 1910:49). Another route went from the Bijnor district mart of Afzalgarh, crossing the Ramaganga at Dhikala; the hill trade in the early decades of the present century was largely with the bi-weekly bazaar at Kalagarh on this road (Walton 1910: 50).

Upper Gangetic Plains—Middle Gangetic Plains—Vindhyan Region

The occurrence of semi-precious stone artifacts and copper objects at Saipai in the Etah district and Jakhera and Atranjikhera in the Etawah districts strongly suggests the existence of this axis. It is our contention that these were being procured from the Vindhyan

region. The occurrence of artefacts in these stones at Sringaverapura in the Allahabad district, a site which in any case shares some ceramic attributes with the O.C.P. pottery, is also an indication of such links. The occurrence of debitage also suggests that raw material was being especially procured for local manufacture and was very much an item of trade. Some amount of copper may also have reached the upper Gangetic plains from the Vindhyas where, as already noted, it occurs in the Banda and the Allahabad districts. Furthermore, at Jakhera, black-slipped ware, a common element in the contemporary sites of the middle Ganga plains, was recovered (*I.A.R.* 1974–5: 43). Also significant is the occurrence of certain upper Gangetic ceramic attributes at Kausambi and Sarai Mohana.

The route followed from the Etah district must have gone along the Ganga, which is entirely navigable, till the Allahabad district from where the Vindhyas were easily approachable. From Etawah, the Jamuna river must have been followed to the Kanpur district, where nine black-and-red ware sites have been found, and across to Allahabad and the Vindhyas. The Kanpur district gazetteer (Nevill 1920: 85) clearly mentions that, before the consolidation of the road and railway systems, the Jamuna and the Ganga were the chief lines of traffic. If a land route was followed in the light of the alignment of O.C.P. and black-and-red ware sites, it could have followed the direction of 'the Mughal road or Badshahi Sarak, leading from Agra and Etawah through Sikandra, Zainpur, Bognipur, Chaparghata and Ghatampur to Kora, Kara and Allahabad' (Nevill 1920:85).

Upper Gangetic Plains

The significant directions along which the upper Gangetic plains had opened out will be discussed in this section primarily on the basis of the distribution of O.C.P. and black-and-red ware sites. We have argued below that it was basically along the Ganga and the Jamuna rivers that the upper Gangetic plains had opened out. It is entirely possible that land routes were significant in the intra-regional traffic of the region and may have intersected these rivers at various places. However, the probability of the riverine routes being more significant is strong especially since, even after the creation of a rail network, it was the Ganga and the Jamuna rivers that were the lifelines of the region and the major trade routes (cf. Nevill 1920:85, 91; Nevill 1905:63).

One major line along which we find numerous O.C.P. settlements, copper hoards and some black-and-red ware sites stretches from Saharanpur—Muzaffarnagar—Bulandshahr—Aligarh—Etah—Mainpuri—Bijnor—Bareilly—Budaun—Shahjahanpur to

Hardoi. Over sixty O.C.P. sites have been found in Saharanpur district, where at Baharadarabad, Bargaon and Indilapur copper hoards have also been found. Three O.C.P. sites were found in Muzaffarnagar district. In Bulandshahr, seven O.C.P. sites have been found (M. Lal 1984:28), including Lal Qila which is located twenty-four kilometres from Anupshahr along the Aligarh—Bulandsahr road. One O.C.P. site and three black-and-red ware sites have been found in Aligarh district (M. Lal 1984b:28; *I.A.R.* 1962–3:31; 1966–7:33). The protohistoric sites of Saipai and Jakhera are located in Etah district. In Mainpuri district, in addition to a copper hoard that was found in the District Headquarters, a few sherds of black-and-red ware were found at Eka and Nagla Harelia (*I.A.R.* 1977–8:58). Rajpur Parasu in Bijnor district has yielded a copper hoard and O.C.P. sherds. From Bareilly district, Period I at Ahichhatra is an O.C.P. level. Baharia in Shahjahanpur district yielded a copper hoard and O.C.P. In Budaun district, Rafiabad and Sirsa Ther have yielded O.C.P. and black-and-red ware while Gulariya has yielded O.C.P. types and Abudullahaganj has yielded plain black-and-red ware (*I.A.R.* 1978–9:21–2). A copper hoard has also been found at Bisauli in Budaun district. From Hardoi O.C.P. sherds were recovered from fields near Kamalapur and Mujahidpur which also yielded copper hoards. A copper hoard was also noted at Madanpur in the same district.

In this region, the Ganga was crucial. The highest point on the Ganga where boats had ever reached was Shukartar (Saharanpur district) (cf. Atkinson 1875:152). From above this point, the navigation was entirely restricted to timber rafts. Interaction with Roorkee tehsil where O.C.P. sites occur may therefore have followed a land route. Going through Muzaffarnagar and Bulandshahr the Ganges passed along the boundary of Aligarh to reach Mainpuri and Bijnor districts. Nevill's (1928:88) comments on the communication in this district are significant: 'In early days. . . . the Ganges was the only highway, and even that was only navigable but for a portion of its length; none of the old imperial routes lay through the district, the greater part of which was clothed in impenetrable forest.' From the Moradabad area a route also went to Barcilly from where Shahjahanpur was reached. A land route does exist from Bareilly to Budaun (Nevill 1907:62), although it is likely that the Ganga was the chief route between Bijnor and Budaun. Going through Hardoi district, the Ganga finally reached its middle course from where Allahabad was reached (Nevill 1909: 50).

The other axis that had opened up went along the Jamuna going through Mathura to Etah and Kanpur. Copper hoards have been found in Mathura district. Off Mathura, in Bharatpur district, in

addition to Noh where black-and-red ware and O.C.P. were found (*I.A.R.* 1963–4:28), Pengore and Sewar have also yielded a similar cultural sequence (*I.A.R.* 1965:9). In addition to Atranjikhera in Etawah district, a copper hoard has been found at Niorai. In Kanpur district, nine black-and-red ware sites have been found (M. Lal 1984b:189).

The line of communication must have followed the Jamuna which, incidentally, is navigable along this entire course to Kanpur and further on to Allahabad. Atkinson's (1876:234) gazetteer of the Etawah district noted that boats of 18 ft breadth and 75 ft length navigated the Jamuna by Etawah to Agra.

Vindhyan Plateau—Allahabad region—Sarayupara

There were clearly two phases in the evolution of the lines of movement along this axis. Firstly, in the proto-neolithic and neolithic levels, cord impressed pottery has been found in the Allahabad, Gorakhpur, Basti and Saran districts. Similarities in the lithic assemblages of the Allahabad neolithic sites and those in Gorakhpur and Basti districts have also been noted. Equally significant is the evidence of the use of raw material of Vindhyan provenance—crystal, chert and chalcedony being some of them—at the sites of Susipar and Barhagon, for the manufacture of lithic tools.

In the subsequent phase, we see an expansion of this axis with broadly similar pottery—black slipped wares, black-and-red ware and associated wares—occurring at Sohgaura and Narhan in the Gorakhpur district, Banimilia-Bahera and Patharaha in Mirzapur district, at Manjhi and Chirand in Saran district, at Kakoria in Varanasi district and at Susipar and Barhagon in the Basti district. Also, twelve black-and-red sites were found in the Ghazipur district as well as at Masaon, Joharganj I and II in Varanasi district. Thus a definite zone of interaction extended from Mirzapur and Saran to Varanasi, Ghazipur, Basti and Gorakhpur.

The routes along this axis must have been mainly riverine. From Mirzapur which is practically in the Vindhyas, through the Ganga, the Allahabad and Benares districts were reached. The movement of chert, chalcedony and other semi-precious stones to the Sarayupara region must have gone along this route. In this regard, it is interesting to note that even in 1911, from Mirzapur, a large amount of traffic was confined to the transport of stone, and Drake Brockman (1911:82) noted the 'large number of wharves on the river where cargoes are taken in or landed, the majority being on the southern bank owing to the proximity of the quarries.' From Benares also there is a well documented nineteenth century trade with the Gorakhpur region from where corn was brought in great quantities (Fisher and Hewett 1884:15). From Benares to

Ghazipur the Ganga and the Gomti, which is also navigable, could have been ascended (Nevill 1909:67, 71). William Buyers in his *Recollections of Northern India* (1848:247) also noted a road between these two regions which followed the river: 'There is a good carriage road from Ghazipur to Benares, through a level, but not very interesting country. It runs in a straight line, parallel with the northern bank of the river, which only occasionally approaches it, in some of its many windings. The Ghumti is the only river of any size that has to be crossed.' Gorakhpur was then reached through a land route crossing the rivers of the district through ferries of which there were a large number in 1838 (Martin 1838, reprint 1976:579). Alternatively, interaction between eastern U.P. (Gorakhpur region) and north Bihar (Saran plain) could have been along the Ghaghra which is navigable throughout the year and along which one of the important ghats ie., Manjhi, has revealed black-and-red ware sherds. Chirand also is located near the Ghagra river, eleven kilometres east of Chhapra town where the Ghagra joins the Ganga. P.C. Roy Choudhury (1966: 248) informs us that, in the earlier period, *bojras* (big boats laden with goods) used to go down from Uttar Pradesh and pass the Saran district for Patna and other places in the lower Ganga region.

Middle Gangetic Plains—Lower Gangetic Plains

A major black-and-red ware horizon, dated to probably the first millennium BC and extending from the West Bengal state across Bihar to Uttar Pradesh, underlines the presence of this route.

The black-and-red ware sites in Varanasi, Ghazipur, Gorakhpur, Mirzapur, Basti and Saran districts have already been noted. The Gaya and Bhagalpur districts were also dotted with sites of the same culture. In Gaya, in addition to Sonpur (*I.A.R.* 1959–60:14) and Taradih (*I.A.R.* 1981–82:11), other black-and-red ware sites have been found (*I.A.R.* 1976–7:12). Apart from Champa in Bhagalpur, two other sites have also yielded black-and-red ware (*I.A.R.* 1982–3:13; 1983–4:12). Furthermore, black-and-red ware was recovered from Chausa in Bhojpur district (*I.A.R.* 1974–5:9) and Maner in Patna district (*I.A.R.* 1984–5:11). Lower down, in West Bengal black-and-red ware sites have been located in Birbhum, Burdwan, Bankura and Midnapur. The sites in Birbhum are as follows: Jashpur, Surath-Rajar-Dhibi, Mahisdal, Haraipur, Kagas, Mundira and Pantanda (*I.A.R.* 1962–3:43; 1963–4:66, 84, 92), among others. In Burdwan, black-and-red ware was recovered from Pandu Rajar Dhibi, Ganga-danga and Mangalkot (*I.A.R.* 1961–2:61; 1962–3:43). The sites of Tulsipur, Raigram, Mandalgram, Dihar, Pokharna and Kumardanga (*I.A.R.* 1967–8:50; 1968–9:41; 1974–5:71; 1981–2:74) in Bankura district have yielded black-and-red ware. This axis extends

up till Midnapur as seen at Bansantapur, Bhadra and Kangsavati there (*I.A.R.* 1961–2:59; 1968–9:42).

A route from Saran went through Mirzapur to Gaya district. Between Mirzapur and Gaya, the Son river, which is navigable, may have been used for communication (Hunter 1877, reprint 1976: 23). The main route, however, went along the Ganges through Patna and then on to Bhagalpur, from where water traffic traditionally passed, on the one hand, southwards by Sahibganj to lower Bengal, and on the other, found its way westwards to upper India. From Bhagalpur, Birbhum must have been approached—W.W. Hunter in *A Statistical Account of Bengal,* Volume XIV, (1877:176) noted to the south of the Ganges a road to Birbhum, commencing from the boundary of the Bhagalpur municipality and ending at Suri, with a total length of one hundred and three miles. Although no navigable rivers flow through Birbhum, the Ajay river which forms its southern boundary and which, in the nineteenth century (Hunter, volume 4, 1876, reprint 1973:327) was navigable by even cargo boats at times, may have been used for communication with Burdwan district. In the nineteenth century, there were at least four land routes to Burdwan from Birbhum (Hunter 1876:106,372–3): (i) a road from Suri through Dubrajpur to the Ajay from where it passed into the Raniganj subdivision of Burdwan; (ii) a road from Purandarpur to the Ajay river from where the road crosses into the Burdwan district: (iii) a road, starting from the Mor river, east of the district across to Ilambazar and Burdwan district; (iv) a road from Suri to Katwa; the Sankhai ferry over the Ajay river was on this road. The Burdwan and Bankura districts, as the presence of black-and-red ware and other cultural elements suggest, were also definitely part of the same interaction zone in this period. Hunter (1876:275), in his description of Bankura, noted one road running northwards from Bankura town to Raniganj as well as another, also from Bankura town, running north-eastwards to Sonamukhi, Khandghosh and on to Burdwan town. It is possible that some of these above-mentioned routes had opened out as early as the first millennium BC.

EXTERNAL TRADE ROUTES

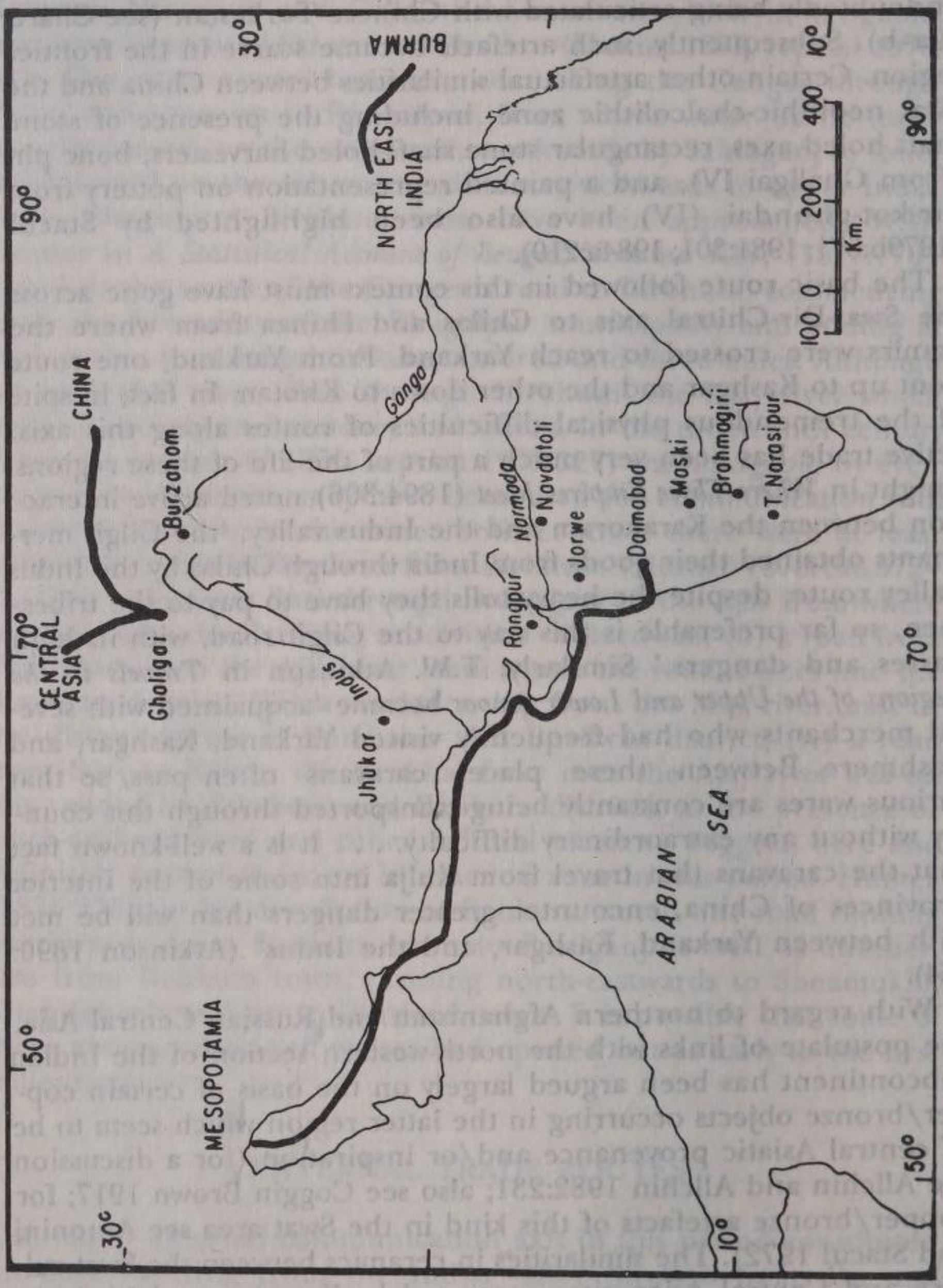
The major external communication axis in this period constituted the line running from the Indus valley through Swat, Dir and Chitral regions to Afghanistan and Russian Central Asia on the one hand, and Chinese Turkestan on the other.

Interaction with Chinese Turkestan was most conspicuous during the phase of the Harappan urbanization, no doubt fuelled by the demand for jade, gold and other raw materials at the monu-

mental centres of the civilization in the Indus basin. Significantly, this is also the period when the maximum jade artefacts are found in the Swat region, the transit area through which this trade was undoubtedly being articulated with Chinese Turkestan (see Charts 19a–b). Subsequently, such artefacts became scarce in the frontier region. Certain other artefactual similarities between China and the Swat neolithic-chalcolithic zone, including the presence of stone shaft holed axes, rectangular stone shaft-holed harvesters, bone pin (from Ghaligai IV), and a painted representation on pottery from Bir-kot-ghundai (IV) have also been highlighted by Stacul (1979b:671; 1981:301; 1984a:210).

The basic route followed in this context must have gone across the Swat-Dir-Chitral axis to Chilas and Hunza from where the Pamirs were crossed to reach Yarkand. From Yarkand, one route went up to Kashgar and the other down to Khotan. In fact, in spite of the tremendous physical difficulties of routes along this axis, active trade has been very much a part of the life of these regions. Knight in *Where Three Empires Meet* (1894:306) noted active interaction between the Karakoram and the Indus valley: 'the Gilgit merchants obtained their goods from India through Chilas by the Indus Valley route, despite the heavy tolls they have to pay to the tribesmen, so far preferable is this way to the Gilgit road, with its high passes and dangers.' Similarly, T.W. Atkinson in *Travels in the Regions of the Upper and Lower Amoor* became 'acquainted with several merchants who had frequently visited Yarkand, Kashgar, and Cashmere. Between these places caravans often pass, so that various wares are constantly being transported through this country without any extraordinary difficulty. . . . It is a well-known fact that the caravans that travel from Kulja into some of the interior provinces of China, encounter greater dangers than will be met with between Yarkand, Kashgar, and the Indus' (Atkinson 1890: 354).

With regard to northern Afghanistan and Russian Central Asia, the postulate of links with the north-western section of the Indian subcontinent has been argued largely on the basis of certain copper/bronze objects occurring in the latter region which seem to be of central Asiatic provenance and/or inspiration (for a discussion see Allchin and Allchin 1982:231; also see Coggin Brown 1917; for copper/bronze artefacts of this kind in the Swat area see Antonini and Stacul 1972). The similarities in ceramics between the Swat culture and Central Asian sites suggested by Kusmina and Litvinsky have been strongly questioned in Antonini's detailed review (1973:243); he has alternatively suggested similarities in the pottery of Dashli I (northern Afghanistan) 'because of the large number of stemmed bowls with shapes resembling those of types VI3, VT8,


30°
BURMA
10°
90°
NORTH EAST INDIA
400
200
100 0
Km.
90°
CHINA
CENTRAL ASIA
70°
Gholigai
Burzahom
Ganga
Indus
Jhukor
Rangpur
Narmada
Navdatoli
Jorwe
Daimabad
Moski
Brahmagiri
T. Narasipur
70°
SEA
ARABIAN
50°
MESOPOTAMIA
30°
10°
50°

Map 33

VT36, and VT37 in the Swat graveyard typology, and of incised grey ware.' Also, a reading of Charts 19a–b clearly underlines the archaeological presence in the northern-west frontier region of different raw materials occurring in Central Asia and Afghanistan—lapis lazuli, copper, gold and silver.

As far as the routes are concerned, there are several geographical possibilities. Firstly, from Hunza and the Pamirs, Afghanistan and Central Asia could be approached to the west. In the nineteenth century, incidentally, this was an important route, as is evident from the description given by Knight (1894:477, 483–4) of the goods found by the troops he accompanied to the Thum of Hunza's castle. The goods from Russia included tooth powder, boxes of rouge, pots of pomade and cosmetics, a coloured portrait of the Czar and another of the Czarevitch, a number of Russian prints, samovars and matches and candles. Since Hunza had to be traversed in the protohistoric period to reach Chinese Turkestan, it is possible that it also mediated trade in raw materials and other articles from Russia. The pass that lay in Hunza was the Kilik pass that led across the extreme east of Afghan territory (Wakhan) into Russian Turkestan (H.L. Nevill 1910:3). Another route which must have been of some importance, especially in the context of the exploitation of lapis lazuli, went north-west of Chitral through the Dorah pass; this leads into the Badakshan district of Afghanistan (H.L. Nevill 1910:4). There was also a route which may have gone via Kabul—north of the Khawak pass, above Kabul, the Khosh-Tapa hoard has yielded some (ie., nos. 7, 8, 13, 17) specimens made in an Indian style or with Indian elements (Dupree et al. 1971: 33).

The suggested affinities between Iran and India in this period, whether comprising ceramic or copper/bronze artefacts are either extremely general or are based on a complete disregard of the chronological parameters of the data. To give only one example, certain pottery forms from Ahar such as the hollow stemmed bowl in grey ware and the stepped dish-cum-bowl, and animal-headed handles, according to the excavation report (Sankalia et al. 1969: 223), are reminiscent of similar examples from Tepe Hissar and Shah Tepe. However, no chronology or level at which these finds occur at the Iranian sites is given. Only some copper/bronze artefacts (cf. dirk from Fort Munro, trunnion axe from Shalozan in Allchin 1982:234–5) seem to be of Iranian provenance/inspiration.

The basic evidence for contact with Mesopotamia is the occurrence of three cylinder seals, one each at Daimabad (Sali 1986:508) and Maski (Piggott 1944:99) and a third one from an unknown context in central India (Saboor 1914:462). There is no doubt that cylinder seals, even those depicting Indian motifs as the Daimabad and Maski seals, are of Sumerian origin/inspiration. At the same time,

the Maski and the central Indian seal are both from extremely unsure contexts. We are, therefore, left with only one securely dated seal, the specimen from Daimabad, to surmise on the existence of Indo-Sumerian contact. The presence of obsidian flakes in the late Prabhas levels (1500–1200 B.C.) (Dhavalikar 1977–8:101) could also be stray specimens from the near Eastern obsidian network. The limited links with West Asia could have been maintained through a maritime contact between the Gujarat coast and Maharashtra; the presence of Lustrous Red Ware in some late tombs of Bahrain (Rao 1987:48) is also suggestive of this. Finally, the jadeite artefacts at Daojali Hading and other sites in the Naga hills suggest procurement of raw material from upper Burma, possibly Bhamo (for details on this occurrence see Nott 1936:13).

SUMMARY

The configuration of trade routes that evolved in the neolithic-chalcolithic horizons flourishing outside the distribution zone of the Harappan urban phenomenon can be visualized at several levels.

To begin with, there were those routes which articulated trade between some contemporary cultural zones and the Harappan civilization. These have already been discussed in Chapter 3. The orientation of two major routes of this type was as follows: (1) From the mountainous regions to the north-west of the Indus a number of routes from Central Asia, China and northern Afghanistan passed through to the Indus plains, carrying lapis lazuli, jade, gold, silver, and possibly some copper. (2) Similarly, the Ganeshwar-Jodhpura cultural complex with its epicentre in north-west Rajasthan provided copper, in addition to other metals and semi-precious stones, to the Harappan urban centres.

In the late/post-Harappan period, there also developed lines of movement through Rajasthan, Malwa, Gujarat and Maharashtra. (1) The interaction between the Ahar culture of south-east Rajasthan and the late/post Harappan chalcolithic tradition of Gujarat is evidenced most strikingly by the presence of Lustrous Red Ware, etched carnelian beads, lapis lazuli and marine shell at Ahar. Although the direct line from Gujarat to Rajasthan lay through the *Bagur* tract, the two regions may also have been interacting through the routes which traversed the central Malwa plateau. (2) In fact, the possibility of routes or a route from Gujarat through the extensions of the Malwa plateau in the west to Rajasthan is suggested by recent reports—most of them too brief to form the basis for arguing the presence of very conclusive links—on the presence of late/post Harappan ceramic elements including Lustrous Red Ware, in the Ujjain and Morena districts. In

this regard, the two crucial routes followed, on the one hand, the Chambal ravines to reach Kota and further on Chittorgarh, and, on the other hand, the Dungarpur-Udaipur axis which lies at the heart of the Berach-Banas basin. That the Udaipur—Chittorgarh area was the significant point of access into Malwa from Rajasthan is suggested by the presence of Ahar pottery at many sites in the Ujjain, Shajapur and Mandasor districts. In the subsequent Malwa cultural phase, these routes became much more significant, disseminating a number of Malwa ceramic types to Ahar. (3) From the Malwa plateau, there developed, possibly very early, a route going across the Narmada valley to the central Tapti basin. This is suggested by the presence of Kayatha ware at Kaothe. The Lustrous Red Ware occurrences all along a line from the Surat district of Gujarat through Dhulia, Khandesh, Poona, Nasik as also at Navdatoli suggest a possible consolidation of this route in the post-Harappan period. It is, however, the Malwa phase which marks the high point of interaction along this route in the period prior to the early historic phase when, along with Malwa pottery all along this line, shell and coral also came to be included in the artefactual repertoires of important centres in the interior like Prakash, Nevasa, Navdatoli and Maheshwar.

Within the Maharashtra plateau, the Malwa phase coincided with the development of at least three important lines of movement: (1) a route going from the coast to Ahmednagar and Poona; (2) a route going across to the Aurangabad district, where in the Paithan taluk, the site of Apegaon was flourishing; (3) a route going to the east where, in the Vidarbha region, a Malwa level has been uncovered at Tuljapur Garhi.

The routes from Maharashtra towards peninsular south India evolved in several, often interlapping phases: (1) the first route to fall into clear focus was that which connected the central Tapti basin with the upper Krishna valley; the presence of Savalda ware at sites in the Belgaum, Bijapur and Shimoga districts is ample testimony of this. In the subsequent Malwa phase, through the Shorapur doab, ceramic types of that phase percolated into the *maidan* sites such as Hallur and Utnur. The most striking amplification of this route took place in the period of the Jorwe culture, when Jorwe elements occurred in the districts of the Shorapur doab, the north Karnataka region, as well as in south Karnataka; (2) Although S.R. Rao has reported some late/post Harappan cultural elements in the neolithic sites of Andhra Pradesh, clear cultural links between western India and Andhra can be taken back only to the Malwa cultural phase, whose ceramic elements are found in the Pusalpadu and Patapadu industries. At Chandoli and possibly also at Navdatoli, some Andhra ceramic types such as black-on-red

ware and red and brown coarse wares are also found. It is worthy of note that there are no significant Jorwe elements in the Andhra plateau. While routes went across from Bellary to Andhra, there also seems to have been a direct route from the Bidar district to Karimnagar district and further down to neolithic sites in other districts of Andhra. (3) The large number of ceramic types that are common to Piklihal and the neolithic sites of Tamil Nadu suggest that the major route was from the Mysore district. (4) West-east interaction in peninsular south India is suggested by the large number of sites in the north Karnataka plateau with shell and coral in their artefactual repertoires. (5) The shell artefacts found at sites in Andhra Pradesh suggest routes going across the Srisailam hills on to the coast.

Turning our focus to north India, the neolithic-chalcolithic phase there saw the development of a number of arterial communication routes in various directions that possibly opened out most of the Indo-Gangetic divide and the Gangetic plains. The basic outline is as follows: (1) There was a route from the Ambala-Karnal region which went across to the Saharanpur district and from there basically followed the Ganges to the Bareilly district. The presence of late Harappan cultural elements up to Ahichchhatra as well as the distribution pattern of the O.C.P. sites, copper hoards etc., is evidence of interaction along this route. (2) The Jamuna river was also an important line of communication from Mathura till Kanpur. (3) From the Saharanpur and Bijnor districts, routes went into the U.P. Himalayas which were an important source region of copper and stone for the mineral-poor Gangetic plains. (4) Towards the south, the Vindhyas were also providing some raw materials, the region being most easily accessible from Allahabad. From the proto-neolithic and neolithic levels, neolithic cord-impressed pottery has been found in the Allahabad, Gorakhpur, Basti and Saran districts. During the subsequent black-slipped ware phase the Allahabad-Vindhyan route continued to be significant. (5) The second-first millennia BC black-and-red ware horizon that extended from the Varanasi district of Uttar Pradesh through Saran and Gaya districts followed the Ganges to go through Bhagalpur and lower Bengal. An earlier third millennium BC opening up of the Gangetic Valley is suggested by the neolithic level at Chirand but nothing much can be said about this based on the present state of knowledge.

The most important external communication axis, in continuation of the pattern developed in the Harappan period, was towards Afghanistan and Central Asia. Apart from the usual channels of movement through the north-west, a distinctly new configuration during this period was the way in which the Swat-Dir area was integrated with both Afghanistan and Central Asia.

NOTES TO CHARTS

19. *Bir-Kot Ghundai*: Stacul 1980:59–61; Stacul 1985:358. *Loebanr*: Stacul 1980:69–72; Stacul 1977:232–51; Antonini and Stacul 1972:62–243. *Ghaligai* : Stacul 1984:205, 209; Stacul 1979:664–9; Stacul 1969:48–61. *Kherari*: Stacul 1979:662. *Aligrama*: Stacul and Tusa 1977:173–4. *Lalbatai*: Stacul 1967:231. *Katelai*: Antonini and Stacul 1972:249–422. *Timargarha*: Dani 1967:185–94. *Thana* : Dani 1967:223. *Zarif Karuna*: Khan 1973:16–25, 54–64. *Butkara*: Stacul 1972:433–93.
20. *Burzahom* : *I.A.R.* 1971–2:24, 1973–4:15. *Gufkral*: *I.A.R.* 1981–2:19–23.
21. *Gaonri*: *I.A.R.* 1978–9:20. *Gaonri Bandh*: *I.A.R.* 1978–9:20. *Golyari*: *I.A.R.* 1979–80:62–5. *Khadra*: *I.A.R.* 1979–80:62–5. *Khalra*: *I.A.R.* 1978–9:20. *Kishore Para*: *I.A.R.* 1979–80: 62–5. *Kuradhan-ki-Dhoongri*: *I.A.R.* 1978–9:20. *Lohariwas Sola*: *I.A.R.* 1979–80: 62–5. *Nimodh*: *I.A.R.* 1978–9:20. *Para Bhila Ki Dhani*: *I.A.R.* 1978–9:20. *Purana Mothuka*: *I.A.R.* 1978–9:20. *Pyjora*: *I.A.R.* 1979–80:62. *Tigri*: *I.A.R.* 1979–80:62–5. *Umrawala*: *I.A.R.* 1978–9:2o. *Ganeshwar*: *I.A.R.* 1980–1:61; Agrawala 1984:16. *Buchahar*: *I.A.R.* 1981–2:62. *Jambalpur*: *I.A.R.* 1981–2:62. *Chinchroli*: *I.A.R.* 1980–1:56. *Banar*: *I.A.R.* 1979–80:62–5. *Oda-Ki-Dhani*: *I.A.R.* 1979–80:62–5. *Aheerwala*: *I.A.R.* 1979–80:62–5. *Balwara*: *I.A.R.* 1979–80:62–5. *Basedi*: *I.A.R.* 1979–80:62–5. *Bhoodoli*: *I.A.R.* 1979–80:62–5. *Bihar*: *I.A.R.* 1979–80:62–5. *Chamrauli*: *I.A.R.* 1979–80:62–5. *Delsar*: *I.A.R.* 1979–80:62–5. *Dhooniwala*: *I.A.R.* 1979–80:62–5. *Dilpura*: *I.A.R.* 1979–80:62–5.
22. *Ahar*: *I.A.R.* 1954–5:14–15; 1955–6:11; *Sankalia* et al. 1969: relevant sections. *Gilund*: *I.A.R.* 1959–60:41. *Padaliya*: Agrawala 1984:156. *Gadriawas*:: Misra 1967:151. *Bagor*: *I.A.R.* 1968–9:27–8; Misra 1973:98, 104–5.
23. *Kayatha*: Wakankar 1967:12–29; Ansari and Dhavalikar 1975:relevant sections. *Navdatoli*: Sankalia et al. 1958: relevant sections; Sankalia et al. 1971: relevant sections. *Tripuri*: Dikshit 1955: relevant sections. *Rangai*: Khare 1980–1:56. *Nagda*: Banerjee 1986: relevant sections. *Atud Khas*: *I.A.R.* 1984–5:45. *Pipliya Lorka*: *I.A.R.* 1983–4:53. *Dangwada*: *I.A.R.* 1979–80:54–5. *Eran*: *I.A.R.* 1963–4:15–16; 1964–5:16–18. *Besnagar*: *I.A.R.* 1964–5:19. *Maheshwar*: Sankalia et al 1958: relevant sections.
24. *Prakash*: Thapar 1964 and 1965:94–116. *Tuljapur Garhi*: *I.A.R.* 1984–5:50. *Bahurupa*: *I.A.R.* 1959–60:37. *Savalda*: *I.A.R.* 1959–60:37. *Pimplas*: *I.A.R.* 1958–9: 24. *Satola*: *I.A.R.* 1958–9:24. *Koparli*: *I.A.R.* 1958–9:24. *Waladgaon* : *I.A.R.* 1984–5: 150. *Pandari*: *I.A.R.* 1981–2:49. *Sastevadi*: *I.A.R.* 1971–2:35. *Theur*: *I.A.R.* 1969–70:27–9. *Methi*: *I.A.R.* 1980–1:40. *Kurkawada*: *I.A.R.* 1980–1:40. *Nasik*: Sankalia and Deo 1955: relevant sections. *Jorwe*:: Sankalia and Deo 1955: relevant sections. *Kopargaon*:: Sankalia and Deo 1955:155. *Nevasa*: Sankalia et al. 1960: relevant sections; Ansari 1978–9:16. *Bahal*: *I.A.R.* 1956–7:17. *Inamgaon*: Sankalia et al. 1975:5–10. *Songaon*: Deo and Mujumdar 1969: relevant sections. *Chandoli*: Deo and Ansari 1965: relevant sections. *Daimabad*: Sali 1986: relevant sections.
25. *Nagarjunakonda*: Subrahmanyam 1975: relevant sections. *Chinnamarur*: *I.A.R.* 1978–9:64–5; 1979–80:2. *Hullikallu*: *I.A.R.* 1978–9:62–3. *Guntupalli*: Rami Reddy 1978: relevant sections. *Tadpatri*: *I.A.R.* 1973–4:1. *Boggula Gonde*: *I.A.R.* 1973–4:6. *Buddagavi hill*: Rami Reddy 1978: relevant sections. *Chetna palli*: Rami Reddy 1978: relevant sections. *Buthamahal hill*: Rami Reddy 1978: relevant sections. *Chinnada-Dukonda*: Rami Reddy 1978: relevant sections. *Pillalapalli*: Rami Reddy 1978: relevant sections. *Ramapuram*: *I.A.R.* 1982–3:3–4; 1983–4:3–4. *Konda Bucchimpeta I.A.R.* 1983–4:6. *Banjaripeta*: *I.A.R.* 1983–4:6. *Gandluru*: *I.A.R.* 1983–4:1; 1982–3:1. *Veerapuram*: Sastri et al. 1983: relevant sections. *Pusalapadu*: Sarma 1967:89–90. *Donekal North-East*: Rami Reddy 1978: relevant sections. *Godekal West*: Rami Reddy 1978: relevant sections. *Godekal North West*: Rami Reddy 1978: relevant sections. *Gulpalayam*: Rami

Reddy 1978: relevant sections. *Havaligi*: Rami Reddy 1978: relevant sections. *Karakumkkala*: Rami Reddy 1978: relevant sections. *Lattavaram hill*: Rami Reddy 1978: relevant sections. *Malapuram*: Rami Reddy 1978: relevant sections. *Mallappa-Konda*: Rami Reddy 1978: relevant sections. *Mudigal*: Rami Reddy 1978: relevant sections. *Peddadandu-konda*: Rami Reddy 1978: relevant sections. *Rayadrug*: Rami Reddy 1978: relevant sections. *Urvakonda*: Rami Reddy 1978: relevant sections. *Vajrakarur*: Rami Reddy 1978: relevant sections. *Vidupana-Kallu West* : Rami Reddy 1978: relevant sections. *Metupalle*: *I.A.R.* 1963–4:4. *Sivavaram*: *I.A.R.* 1963–4:4. *Patapadu*: Allchin 1962–222. *Velpumadugu*: Rami Reddy 1978: relevant sections. *Adoni-east*: Rami Reddy 1978: relevant sections. *Kupgal*: Rami Reddy 1978: relevant sections. *Singinapalli*: *I.A.R.* 1967–8:3.

26. Satyanarayana Rao 1972; Karunakaran 1975; Sivadas et al. 1985; Rajagopal 1979a; Rajagopal 1978.
27. *Hallur*: Nagaraja Rao 1971: relevant sections. *Tekkalakota*: Nagaraja Rao and Malhotra 1965: relevant sections. *Piklihal*: Allchin 1960: relevant sections. *Utnur*: Allchin 1961: relevant sections. *Sanganakallu*: Subbarao 1948: relevant sections. Ansari and Nagaraja Rao 1969: relevant sections. *Brahmagiri*: Wheeler 1947–8: 202–69. *Maski*: Thapar 1957: 12–106. *Budihal* : Paddayya 1973: relevant sections. *Mallur—I*: Paddayya 1973: relevant sections. *Kodekal*: Paddayya 1973: relevant sections. *Budihal—S*: *I.A.R.* 1965–6:32. *Tirth*: Paddayya 1973: relevant sections. *Kakkera*-1: Paddayya 1973: relevant sections. *Kannekolur*-1: Paddayya 1973: relevant sections. *Kannekolur*-2: Paddayya 1973: relevant sections. *Bijaspur*: Paddayya 1973: relevant sections. *Yerkanhal*: Paddayya 1973: *Birnur*: relevant sections. *Benkanpalli*: Paddayya 1973: relevant sections. *Shakapur*: Paddayya 1973: relevant sections. *Tadbid*: Paddayya 1973: relevant sections. *Budnal*: Paddayya 1973: relevant sections. *Wadgiri*: Paddayya 1973: relevant sections. *Kupi*: Paddayya 1973: relevant sections. *Sitimani*: Paddayya 1973: relevant sections. *Mudenur III*: Nagaraja Rao 1962–3:65. *Nadiharalahalli*: Nagaraja Rao 1962–3:67. *Hadarageri*: Nagaraja Rao 1962–3:68. *Fatehpur*: Nagaraja Rao 1962–3:75. Mannur: *I.A.R.* 1967–8:36. *Menasgi*: *I.A.R.* 1967–8:36. *Nidagundi*: *I.A.R.* 1967–8:36. *Savadi*: *I.A.R.* 1967–8:36. *Nidagundikop*: *I.A.R.* 1967–8:36. *Kallur* : *I.A.R.* 1968–8:67. *Kirthur*: *I.A.R.* 1968–9:67. *Maradigi*: *I.A.R.* 1968–9: 67. *Guddey Mardi*: *I.A.R.* 1967–8:36. *Urchan*: *I.A.R.* 1960–1:65.
28. G.S.I. Publications, including Ziauddin and Narayanaswami 1974.
29. *Banahalli*: *I.A.R.* 1983–4:42–4. *Gangasadara*: *I.A.R.* 1974–5:20. *Muttalavadi*: *I.A.R.* 1974–5:20. *Sivakalli*: Krishnamurthy 1971:5. *Hemmige*: Rao and Nagaraju 1974: relevant sections; *I.A.R.* 1963–4:26. *T. Narasipur*: Seshadri 1971:2; *I.A.R.* 1964–5:32.
30. *Vattamalai*: Narasimhaiah 1980:63ff. *Dalamalai*: Narasimhaiah 1980:63ff. *Togarapalli*: Narasimhaiah 1980:63ff. *Mullikadu*: Narasimhaiah 1980:70–2. *Kappalavadi*: Narasimhaiah 1980:60. *Bargur*: Narasimhaiah 1980:60. *Paiyampalli* : I.A.R. 1967–8:26–8; 1964–5:22. *Tirumalai* : *I.A.R.* 1965–6:24. Senmali: *I.A.R.* 1972–3:62.
31. *Gadhrona*: *I.A.R.* 1963–4:45. *Ambkheri*: *I.A.R.* 1963–4:56. *Bargaon*: *I.A.R.* 1963–4:57. *Saipai*: *I.A.R.* 1970–1:38. *Jakhera*: *I.A.R.* 1974–5:44. *Lal Qila*: Gaur 1973:156. *Atranjikhera*: Gaur 1983: relevant sections.
32. M. Lal 1980–1.
33. *Chopani Mando*: Sharma et al. 1980: relevant sections. *Koldihwa*: Sharma et al. 1980: relevant sections. *Mahagara*: Sharma et al. 1980: relevant sections. *Panchoh*: Sharma et al. 1980: relevant sections; *I.A.R.* 1975–6:47. *Naraini*: *I.A.R.* 1975–6:42. *Ranipur Khaki*: *I.A.R.* 1975–6:42. *Bhikrampur*: *I.A.R.* 1970–1:36. *Purawa*: *I.A.R.* 1970–1:36.

34. *Sringaverapura*: Lal and Dikshit 1978–9:4. *Sonepur*: *I.A.R.* 1956–7:19; 1959–60:14; 1970–1:5–6. *Chirand*: Verma 1970–1:20–1; *I.A.R.* 1963–4:6; 1970–1:6. *Kakoria*: *I.A.R.* 1962–3:39; Misra 1981:44. *Sohagaura*: *I.A.R.* 1974–5:47. *Kheradih*: *I.A.R.* 1982–3:93. *Taradih*: Prasad 1984:92–3; *I.A.R.* 1983–4:12. *Susipar*: *I.A.R.* 1983–4:87. *Barhagon*: *I.A.R.* 1983–4:87. *Oriup*: Verma 1970–1:20–1. *Manjhi*: *I.A.R.* 1983–4:15; 1984–5:12.
35. Raghunandan et al. 1981: 144–64.
36. *Kurkutia*: *I.A.R.* 1959–60:50. *Mahisdal*: *I.A.R.* 1963–4:60. *Susinia*: *I.A.R.* 1965–6:57. *Dihar*: *I.A.R.* 1983–4:92–3. *Singhbhum sites*: *I.A.R.* 1962–3:6. *Pandu Rajar Dhibi*: *I.A.R.* 1963–4:62; 1964–5:47; Das Gupta 1964: 25. *Bharatpur*: *I.A.R.* 1973–4:32. *Basantapur*: Das Gupta 1964:35. *Orissa sites*: *I.A.R.* 1958–9:36, 38.
37. M. Lal 1980–1.
38. Choudhury 1985:35ff.

5

The Period between *c.* 1000 BC and *c.* 200 BC (The Iron Age and the First Phase of the Early Historical Period)

This chapter investigates the arterial communication routes in India, between 1000 BC and 200 BC. This is broadly the period following the ushering in almost all over India of a substantially dependent village life, marked by the large-scale introduction and use of iron, and culminating in some areas in what has been described as the 'second urban revolution'. On the political plane, one witnesses the clustering and amalgamation of diverse units into the 'solasa mahajanapadas', and the subsequent inclusion of a large number of such principalities, along with a number of other regions previously peripheral to developments in north India, under the overarching influence of the Mauryan empire. On another level, there was a widespread religious renaissance, exemplified most significantly in the doctrine of Gautama Buddha, a development which saw material expression in the rich mosaic of sculpture and stupa that came to dominate large sections of central and peninsular India. In the north-west, around this very time, the intrusions of the Achaemenids and Alexander left behind a hybrid legacy along the regions where they marched, culminating in the Indo-Greek era when many such cultural elements came to influence the great plains of India, traversing, in fact, the Vindhyan barrier, as the *garuda dhvaja* of Heliodorus at Besnagar suggests.

A voluminous literature has grown up around many of the issues connected with this period. The beginnings of iron technology and its archaeological and cultural ramifications, the concept, character and chronology of different pottery types such as the Painted Grey Ware and the Northern Black Polished Ware, and the cultural antecedents of the south Indian megaliths are some such issues that have generated a vast corpus of literature (Rai and Roy 1980–1; Gillies and Urche 1983; Roy 1983, 1984; Nautiyal 1989; Gururaja Rao 1978; Deo 1982; Tripathi 1973, 1976; Banerjee 1965; Chakrabarti 1972–3, 1976, 1981–3; Sahi 1979; Leshnik 1974; Sundara 1979; Soundara Rajan 1969). Most of these issues, however, are not relevant to the aim of the present chapter which is to pinpoint the resource-use, resource-distribution and distribution of cross-cultural

elements and outline on their basis the routes of communication during this period. In addition to the archaeological data, there becomes available, for the first time, a body of literature, Brahmanical and Buddhist, which, in spite of later interpolations, substantially reflects the social conditions of the period under consideration. This, along with the inscriptional sources that also throw expressive light on the movement of people and commerce, have been used to elucidate the links between different cultural subregions.

DATA ON INTERNAL INTERACTION

Kashmir

The appearance of iron in Kashmir coincides with the historical period which is characterized mainly by the presence of a red ware associated with the North Black Polished ware (hereinafter referred to as N.B.P.). Such sites are found in the Baramulla (*I.A.R.* 1981–2:16–17), Pulwama (*I.A.R.* 1981–2:25) and Anantnag districts (*I.A.R.* 1980–2:21; Gaur 1987). Kalhana's *Rajatarangini* which noted four places that Asoka is supposed to have founded (Sukaletra, Vitastaha, Srinagri and Vijayesvara) (verses 101–7 of Book I, cited in Chakrabarti 1984b:112) suggests the possibility of Kashmir being within the ambit of the Mauryan empire. In the post-Mauryan period, contacts with the North Western Frontier region continued as exemplified by the presence of Greek coins, whose exact find spots are not always known (cf. Ray 1957). On the basis of their abundance, R.C. Kak (1933, reprint 1971:50) suggested 'the existence of considerable commercial intercourse if not actual political connection, between the valley and the principalities of Peshawar and Kabul in the last two centuries BC.'

The Sitewise Distribution of Raw Materials

Chart 39 outlines the raw materials used in this period in Kashmir. These are iron, silver and copper.

Chart 39

KASHMIR–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Gufkral*	*Semthan*
Copper/ Bronze		coins, objects, pieces
Iron	objects	arrowhead, slag, objects
Silver		coins

The Evidence of Manufacture of Finished Products at Different Sites

No published evidence is available on the local manufacture of finished products in the sub-region.

The Raw Materials Found Within the Sub-Region

The extensive copper mineralization in Kashmir has already been mentioned (pp. 152–53).

Iron

Chakrabarti (1984b:112), on the basis of W.A. Lawrence's (1895: 62–3) testimony, noted a tradition of pre-industrial iron smelting there. Lawrence noted that 'Iron has been discovered and worked in several places in the valley, and there are extensive workings of iron ore in the neighbourhood of Sof. . . .The Kashmiris regard the Sof iron as superior to the iron imported from India for the purposes of agricultural implements, and the blacksmiths always speak of it most favourably.' This ore, incidentally, was procured from a bed of impure calcareous limonite, found in the rocks east of Achabal. Iron ore occurrences have also been noted at Sope, Ouri and Khrew (Bhoothalingam 1969:72; Kamili 1967).

The Raw Materials Available Outside the Sub-Region

AFGHANISTAN

The presence of silver in Afghanistan has already been noted (p. 28).

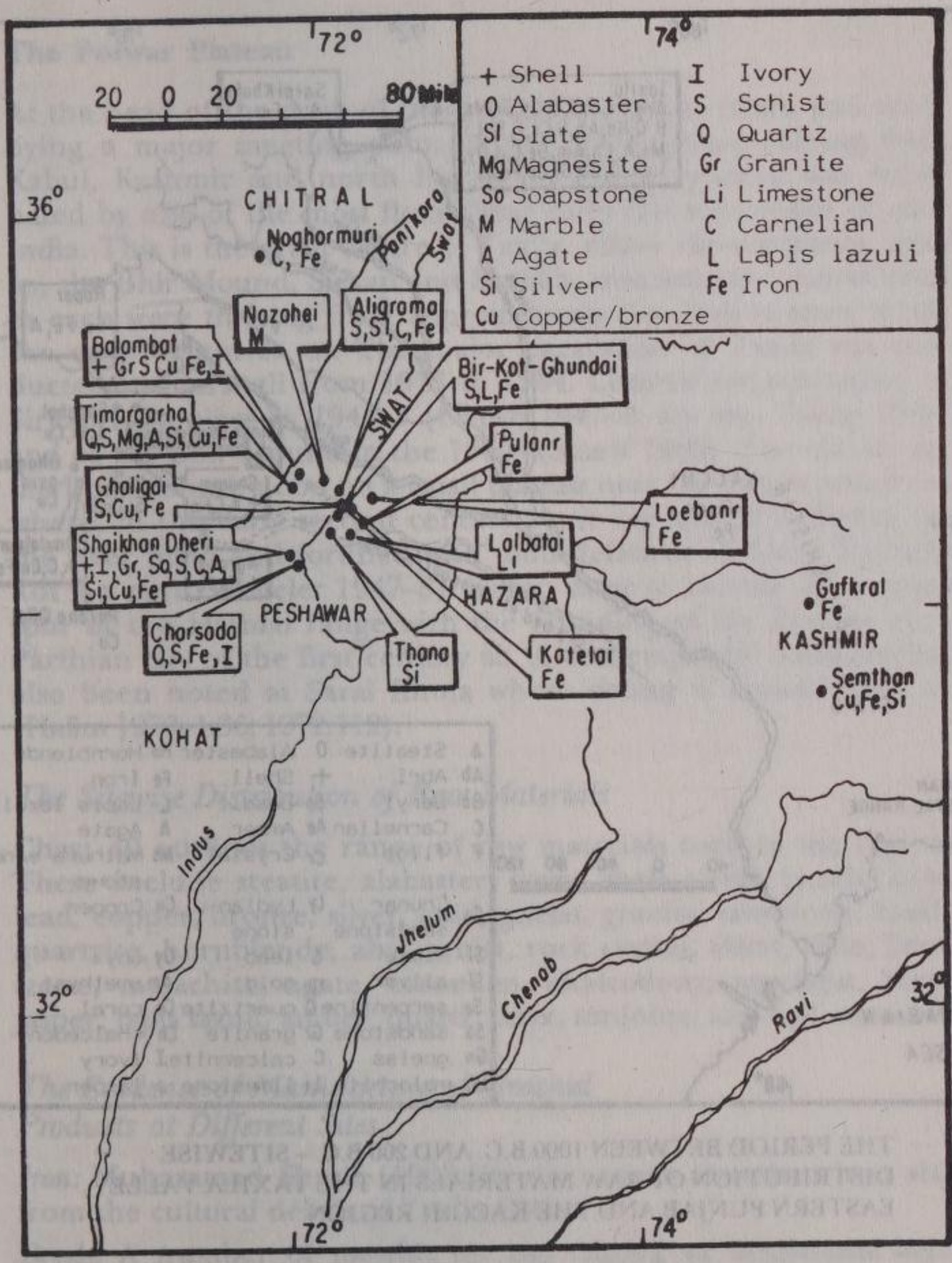
Ceramic and Other Artefactual Links

The affinity of the Kashmir valley with the North West Frontier Province is evident in, among other things the presence of an early historic red ware associated with N.B.P. ware at Gufkral (III) and Semthan (II), (*I.A.R.* 1981–82:25; 1980–1:21). This ware has also been found at Bunagantmula, Drangbal, Mulsama and Bambyar (*I.A.R.* 1981–2:16). Additionally, Semthan has yielded a 2nd century BC Kharoshthi inscription on a pottery piece, a small clay seal depicting an Indo-Greek deity (Period II) (Shali 1988:112) as well as Indo-Greek coins on the surface (*I.A.R.* 1980–1:21).

Discussion

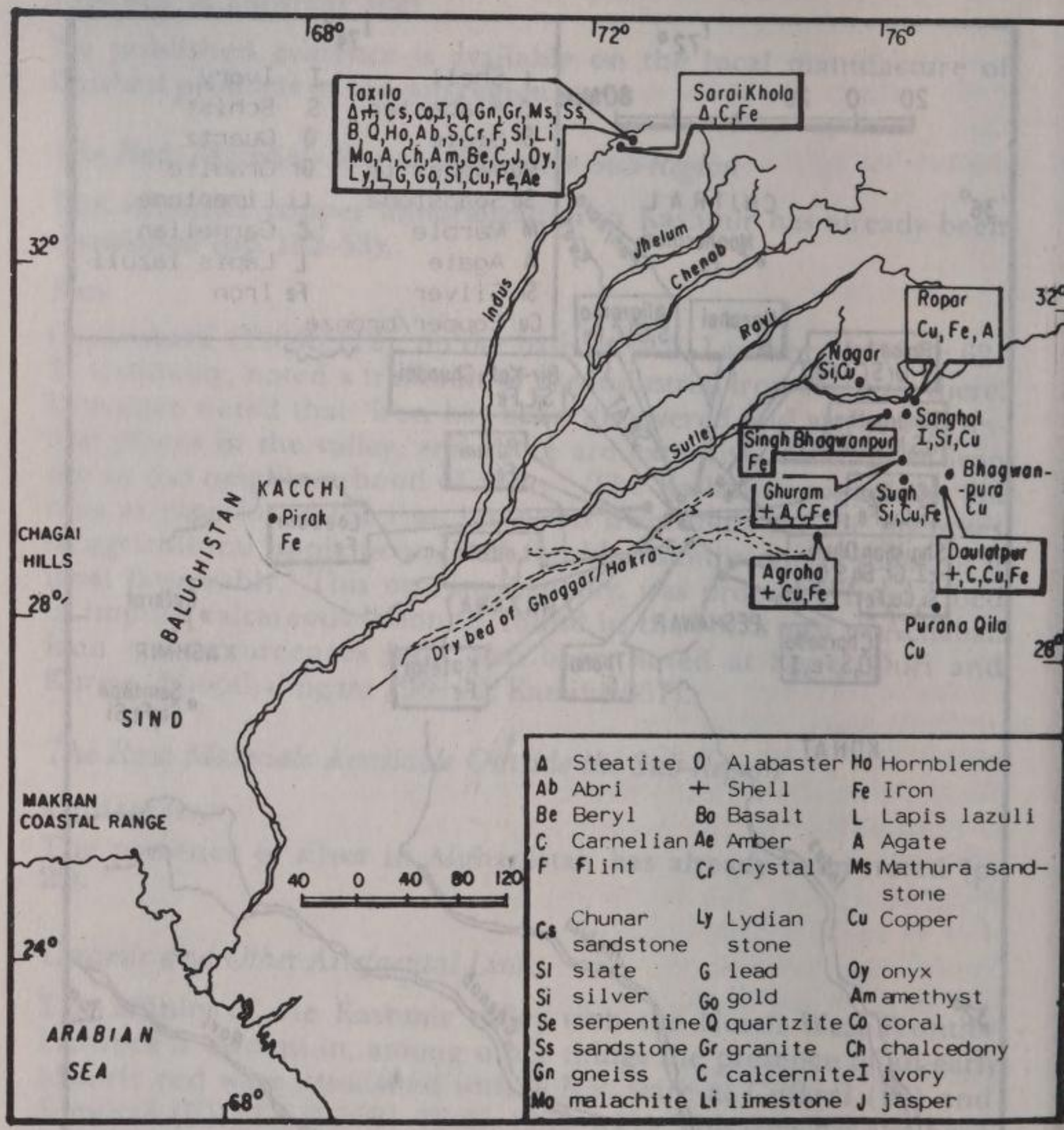
Not much can be inferred about Kashmir during this period, but one would suggest that, with their base in Taxila, the Mauryas

Map 34



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. - SITEWISE DISTRIBUTION OF RAW MATERIALS IN KASHMIR AND THE REGIONS TO THE NORTH OF THE INDUS

Map 35



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE TAXILA VALLEY, EASTERN PUNJAB AND THE KACCHI REGION

found it comparatively easy to integrate Kashmir in their administrative framework.

The Potwar Plateau

At the head of the doab of the Indus and Jhelum rivers, and occupying a major meeting point of the trade routes coming from Kabul, Kashmir and north India, the Potwar plateau was dominated by one of the most flourishing early historic centres of early India. This is the great centre of Taxila, where three separate cities ie., the Bhir Mound, Sirkap and Sirsukh, with several cultural levels in each were thriving from approximately the sixth century BC till the early centuries AD. The major excavation of Taxila was conducted by Marshall from 1913 to 1934. Limited reexamination of Sirkap took place in 1944–5 (Ghosh 1947–8; see also Young 1946) and of the Bhir Mound in the 1960s (Sharif 1969). The oldest city, the Bhir Mound, stood on a small plateau near the Tamra *nala* from where, in the early second century BC, it was shifted to Sirkap on the river plain and fortified with mud defences of which Kachcha Kot is a part (Wheeler 1947–8). Sirkap came to include the western spur of the Hathial range with the founding of the Saka or early Parthian city of the first century BC. A contemporary cemetery has also been noted at Sarai Khola whose dating is around 1000 BC (Halim 1970–1:36; 1972:112).

The Sitewise Distribution of Raw Materials

Chart 40 outlines the range of raw materials used in the region. These include steatite, alabaster, ivory, shell, coral, pearls, iron, lead, copper/bronze, silver, gold, gneiss, granite, sandstone, basalt, quartzite, hornblende, abri, schist, rock crystal, chert, slate, limestone, malachite, agate, carnelian, chalcedony, amethyst, beryl, jasper, lapis lazuli, amber, quartz, onyx, sardoine, and Lydian stone.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Muhammad Sharif (1969:12) discovered abundant iron slag from the cultural debris of Taxila (IV).

Beads: A number of moulds for the casting of ornaments were found at the Bhir Mound and at Sirkap. From the Bhir Mound, a mould for two pendant beads, cut of a fine blotched grey slate was noted (Marshall 1951:506). Sirkap yielded two clay stone moulds, one (No. 142) of which was for a pair of finger rings. Two steatite moulds, one of which (No. 143) was engraved with a small beaded medallion, were also recovered from the site (Marshall 1951:507).

Chart 40

THE POTWAR PLATEAU–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Sarai Khola*	*Taxila*
Steatite	beads	cask, moulds
Shell		bangles, bangle fragments, beads
Coral		beads
Ivory		ear reels, figurine, pendant, hair pins, rod, spindlewhorl, counters, arrowhead, ram head, dagger hilt piece, beads
Alabaster		saucer, ringstone
Ordinary Stone		Gneiss pivot stones, pestles. Granite pivot stones, beads. Mathura sandstone quern. Sandstone querns, mullers, ringstone. Basalt mullers. Quartzite mullers. Hornblende mullers, pestles, mirror handle, knife blade fragment. Abri pestles, cup, bead. Schist dishes, trays. Rock crystal trays. Chert burnishers. Slate seals, mould. Limestone beads. Malachite bead
Semi-Precious Stone	Carnelian ring-stone	Agate bowl, vessel fragment, seal, polishers, beads. Chalcedony burnisher, seal, beads, polishers. Amethyst beads. Beryl beads, Carnelian beads. Jasper beads. Amber beads. Quartz crystal beads. Onyx beads. Lydian stone touchstone. Sardoine polisher.
Lapis Lazuli		beads
Lead		ring, spool, strip
Gold		ear pendants, necklaces, amulets, bracelets, bangles, amulet case, terminal, head ornaments, disks
Silver		necklace, amulet case, finger rings, coins, beads, pendants
Copper/ Bronze		bracelets, bangles, armlets, pendants, nail parers, brooches, pot, antimony rods, hair pin, needles, blow pipes, stoppers, bowls, cups, pans, fragmentary objects, basins, burner, beads, incense bowl, ink pots, pens, stilii, bells, surgical & other instruments, hinge, ring, coins
Iron	rings, rod, bracelet, beads	bowl, spoon, sieve, scale pan, ringholds, swords, daggers, spear, arrowheads, clamp, elephant goad; axe, adzes, chisels, staples, decapitator, hooks, knives, tongs, anvils, nails, spades, bangle, tong, bead, slag, rod, key

Beck's (1941:39, 63) classification of the Taxila beads in Sub-division IV ('Irregular and Unclassified') noted specimens that suggest local manufacture. These are Group L which included thirteen pieces of irregular beads and pendants, perforated but roughly ground, and Group XLIX which included twelve specimens of irregular beads and pendants that were only perforated.

Gold/Silver: A pair of tongs were found on the Bhir Mound which, Marshall (1951:554) surmised, were used either by a goldsmith or a silversmith since they were too small for use as ordinary fire-tongs.

The Raw Materials Found Within the Sub-Region

The presence of copper, gold, lead, sandstone, limestone, alabaster and steatite within this sub-region have already been noted (pp. 35, 40, 88, 147, 150).

Ordinary Stone

Marshall (1951:477) noted that basalt, quartzite, hornblende, hornblende gneiss, gneiss, granite, dolerite and basanite were obtainable in the form of pebbles from the Tamra *nala* or the Haro river; Marshall personally picked up specimens of most of the above-mentioned stones from the stream, as well as sandstone and marble. The grey Taraki or Kambial sandstone is also found in abundant quantities fourteen or fifteen miles south-east of Taxila (Marshall 1951: 479). Slate is found within a few miles of Taxila in the Hazara district (Marshall 1951:450).

Iron

Low grade ferruginous laterites of the Salt range were known to have been worked for small-scale local consumption (Coggin Brown and Dey 1955:191).

The Raw Materials Available Outside the Sub-Region

GOMAL PLAIN AND WAZIRISTAN

The presence of the chalcedonic varieties of semi-precious stones ie., agate, jasper, carnelian etc. and chert/flint in this region has already been noted (p. 37).

NORTH WEST FRONTIER PROVINCE

Ordinary Stone

Swat district: Marshall (1951:451) noted several kinds of schist and phyllite stones in the quarries of the southern Swat region, although their precise provenance is not mentioned.

PUNJAB PLAINS

Ordinary Stone

Mianwali district: Rock crystal occurs in the red marls of Mari in this district (Marshall 1951:477).

Attock district: Veined marble (*abri*) is found in the Kawagar hill (*Punjab District Gazetteers-Attock District* 1932:224). In the early decades of the present century it used to be worked into cups and other ornamental objects.

Iron

Coggin Brown and Dey (1955:190) noted a survey made in 1952 that revealed that the Mianwali, Sargodha and Attock districts of west Punjab have workable deposits of iron ore containing about 40 per cent iron. The Attock district gazetteer (1932:226) also noted the tradition of making iron padlocks and stirrups in Fatehganj and at Hasan Abdal.

RAJASTHAN

Carnelian, chalcedony, sardonyx, agate, and jasper occurrences have already been noted (pp. 49, 155–56).

Beryl

Beryl is known to occur in the Ajmer region and is said to have provided material for generations to Jaipur lapidaries (Coggin Brown and Dey 1955:269).

SIND COAST

The shell and coral occurrences on the Sind coast have already been noted (pp. 22, 34).

UPPER GANGETIC PLAINS

Ordinary Stone

Spotted red and white sandstone comes from Mathura, near Agra (Marshall 1951: 478).

MIDDLE GANGETIC PLAINS

Ordinary Stone

The buff-coloured, fine-grained hard sandstone, usually with small black spots, comes from Chunar, in Mirzapur district (p. 222).

CENTRAL ASIA AND AFGHANISTAN

The presence of gold, silver and lapis lazuli has already been noted (pp. 28, 82). We may also note that Russia used to mediate amber to the Roman world; it is possible that Taxila in this period was procuring Baltic amber through that region.

BURMA

Amber

The amber mines of Burma lie around Maingkwan in the Kukawng valley, with the largest active centre at Khanjamaw (Coggin Brown and Dey 1955:629). Shallow pits were apparently dug on the outcrops of these beds and the best amber generally occurred at depths from about 30 to 50 feet.

Ceramic and Other Artefactual Links

The primary non-local element found at Taxila was north Indian in provenance/inspiration. Marshall (1951:432–3), in his report, noted the presence of a black ware which he assumed to be of Greek provenance but which has subsequently been found to be the N.B.P. ie., the fossil type of the Mauryan empire. Apart from one or two stray fragments, almost all the N.B.P. sherds come from Period I. Closer to the region, a series of narrow bent coins, bearing four sequential forms of punchmark, which, according to Michael Mitchiner (volume 4, 1975:309) were struck at Taxila prior to 326 BC, reveal a striking affinity to a parallel series of broad bent bars bearing the same four sequential forms of symbol, struck probably at Pushkalavati.

Discussion

The basic importance of the Taxila valley, situated at a point where trade from many parts of the subcontinent and other neighbouring regions converged, lay in the fact that it has access to diverse kinds of raw materials from regions as far removed as Mirzapur and Mathura. Its association with the Mauryan empire no doubt facilitated such movement, and along with raw materials, the deluxe ware of north India ie., the N.B.P. also reached there. Furthermore, raw materials from Rajasthan, where Nagari and Bairat were flourishing, travelled to Taxila. Taxila was probably the node through which the N.B.P. and its associated wares reached Udegrama and Charsada, on the one hand, and the Kashmir valley, on the other. At the same time, an overview of the raw materials available within the Taxila valley and its immediately adjacent regions, suggests that many of the basic stones and mineral resources that the city-state demanded could be found in the ambit of the sub-region and the North West Frontier province itself.

The North West Frontier Province

This area, whose core constituted the Gandhara of Indian literary tradition, was dominated by Charsada, identified by Cunningham

(1871:89) with the bearing and distance given by Hsuan Tsang for 'the famous city of Pushkalavati, which, in its Pali form of *Pukkalaoti*, was the origin of the Greek name of *Peukelaotis*. Its shorter name of *Pushkala*, or Pali *Pukkala*, became the Greek *Peukelas*.' Situated about three kilometres west of the present town of Charsada, the mound of Bala Hissar, which is part of the eight towns—*Hashtnagar* that dominate the site, was founded in the sixth century BC (Garrick 1885; Marshall and Vogt 1904, reprint 1970; Wheeler 1962) and continued until the 2nd century BC when the urban centre of Shaikhan Dheri, probably founded by Menander, came up (Dani 1965–6:17–214).

The sudden and large-scale presence of iron in the North West Frontier province in the first millennium BC has been differently dated in different regions. In the Dir valley, Dani (1967:48) has placed the iron-bearing graves in Period III (ninth till the middle of the sixth century BC). In the Swat region, however, Period VII has been dated to 500–400 BC (Stacul 1969a). The differential dating of the beginning of iron notwithstanding, the basic settlement pattern and artefactual repertoire (with the exception of iron artefacts) of Period V continued within the settlements flourishing in the Swat valley and Swat Kohistan, the Buner region, the Dir Valley and Chitral (Antonini and Stacul 1972; Stacul and Tusa 1975, 1977; Stacul 1967b, 1969a, 1969b, 1970, 1978; Tusa 1981).

The Sitewise Distribution of Raw Materials

Chart 41 shows the raw materials used in the sub-region. These are iron, copper/bronze, ivory, silver, shell, alabaster, schist, slate, quartz, magnesite, granite, soapstone, carnelian, agate, lapis lazuli, marble-like stone, and limestone.

The Evidence of Manufacture of Finished Products at Different Sites

Ordinary Stone: At Aligrama, a schist object with a hole at one end and with a groove running down the centre of one surface was found which, on the basis of the groove and the concavity displayed by the object in cross section, seemed to be a multi-purpose smoother for smoothing drill heads as well as objects with a large surface area (Stacul and Tusa 1977: 202–3).

The Raw Materials Found Within the Sub-Region

The presence of copper, schist, slate, quartz, granite, semi-precious stones, and limestone has already been noted (pp. 147, 150, 275).

Chart 41

NORTH WEST FRONTIER PROVINCE—THE PERIOD BETWEEN 1000 B.C. AND 200 B.C.

Raw Material	*Aligr-ana*	*Charsada*	*Timargarha*	*Thana*	*Balambat*	*Shaikhan Dheri*	*Ghaligai*	*Pulanr*	*Lalbatai*	*Noghormuri*	*Bir-Kot-Ghundai*	*Nazahei*	*Katelai*	*Loebanr*
Shell					disk, bangle fragments	bead								
Ivory		pyxis			awl, rods	bead								
Alabaster		statuette												
Ordinary Stone	Schist object, smoother, spindle whorls. Slate dishes	Schist beads	Quartz beads. Schist beads. Magnesite beads		Granite basin. Schst lamp. Pebble pounders	Granite quern. Soapstone beads. Schist beads	Schist Sculptured fragments		Limestone spindle whorl		Schist spindle whorl	Marble like macehead		
Semi-Precious Stone	Carnelian bead		Agate beads			Carnelian beads. Agate bead					Carnelian beads			
Lapis Lazuli													bead	
Silver			ring	ring		coins								

(Chart 41 contd.)

Raw Material	*Aligrana*	*Charsada*	*Timargarha*	*Thana*	*Balambat*	*Shaikhan Dheri*	*Ghaligai*	*Pulanr*	*Lalbatai*	*Noghormuri*	*Bir-Kot-Ghundai*	*Nazahai*	*Katelai*	*Loebanr*
Copper/ Bronze			pins, antimony rods, ring, earrings, bangle, cup, wire fragments, needle		pins	coins	pins							
Iron	pin fragment, indeterminate object	spearhead, hook, pyxis, arrowheads	spoon, horse bit, nails, spearhead, pieces, rings, cheekpiece		knife blade, indeterminate objects	axe, arrowhead	bangle, indeterminate object, arrow heads	spearhead, javelin head, pin fragment		arrowhead	spearhead, fragmentary pin		fragments, pins. spear heads, axes	spear heads, pins

Iron

The following note by Coggin Brown and Dey (1955:190) outlines the iron ore resources of the region:

> In the North-West Frontier province, iron ores are known to occur in the Panjkora valley; a large deposit of magnetite has been reported recently from Gowai in Chitral, where haematite also exists in quantity between Sanoghar and Mastey; a band of good, earthy haematite, 5 or 6 feet thick, was noted by Middlemiss on Sorban Hill in Hazara; while in Waziristan, local deposits of haematite and concretionary limonite occur in the Eocene or Mesozoic sedimentary strata.

The Raw Materials Available Outside the Sub-Region

SIND

Shell and ivory came probably from Sind (pp. 22, 75).

POTWAR PLATEAU

The presence of marble in this region has been noted (p. 275).

GOMAL PLAIN AND WAZIRISTAN

Carnelian and agate in this region have been noted (p. 37).

AFGHANISTAN AND CENTRAL ASIA

Lapis lazuli and silver have already been noted (p. 28).

Ceramic and Other Artefactual Links

This region shared similarities with north India, mediated through the Potwar. About a dozen sherds of N.B.P. were found at Charsada in Ch I, and Ch V as well as from the disturbed top filling of the defensive ditch (Wheeler 1962:46). Wheeler (1962:42), in the Charsada report, also mentioned a sherd of N.B.P. from Udegram in Swat in a level dated to the third century BC. The similarities of some Charsada coins with those of Taxila have already been noted (p. 277).

Discussion

The North West Frontier province continued to be a funnel for movements of people as well as goods from Central Asia and Afghanistan to the lower reaches of the Indus, and to other eastern regions beyond the Indus. Not only were there political relations between the Mauryan empire and Gandhara, but the latter region also received goods (like N.B.P. pottery) from there. Charsada, and subsequently Shaikhan-Dheri, shared a number of cultural traits with Taxila which, as already noted, was mediating Mauryan influences to the sub-region.

Punjab Plains

In the classical accounts of early India, the Punjab plains come alive in the context of Alexander's invasion of India (326 BC). The historians accompanying Alexander constantly refer to the rivers of the region, the Indus (Indus), Hydaspes (Jhelum), Acesines (Chenab), Hydrates (Ravi), Hyphasis (Beas) and Zaradrus (Sutlej), and the peoples and towns such as Malavas, Kshudrakas and Sangala (Bevan 1922, reprint 1955: 333ff). Regrettably, the place names mentioned in the literary sources have not been systematically or satisfactorily identified. The only major excavation is that of Tulamba in the Multan district, which Mughal (1967a:22) has identified 'with one of the cities of the Mallois, taken not by Alexander himself but by one of his generals, Peithon, in 326 BC.' In the post-Alexandrian era, Indo-Greek presence in this part of the Punjab is suggested by the discovery of coins of Apollodotus II at Tulamba and at two other sites, Jarahi and Tehri Bhir (Mughal 1967b:1–3).

Baluchistan

The use of iron is seen only at Pirak, situated in the vicinity of the Bolan pass, about twelve miles south of Sibi. Although R.L. Raikes (1963) argued for a very early date for the bichrome painted ware found in abundant quantities on the surface of the site, the bronze age levels are probably not earlier than the late second millennium BC (Casal 1973; Jarrige and Enault 1973). Incidentally, this is one of the only protohistoric sites where the transition from the chalcolithic period to the iron age is clearly indicated.

In Baluchistan, especially along the Makran coast, extending into Iran as far as Fars and the Kirman region, a large number of cairn burial sites were discovered from as early as 1876 and were assigned a Sialk VIB chronological association by a number of archaeologists (Gordon 1950; Ramachandran 1974). A comprehensive analysis of the cultural assemblage and chronology of the burials by Chakrabarti (1979a) has, however, convincingly demonstrated that the earliest tenable date for them would not be before the first century BC which is beyond the scope of the present work.

The Sitewise Distribution of Raw Materials

Chart 42 lists the iron artefacts at Pirak.

Chart 42

BALUCHISTAN–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Pirak*
Iron	arrowheads, bits

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Near a small apsidal oven, bits of iron along with a large quantity of ash, suggest local manufacture of iron artefacts (Jarrige and Enault 1973: 167).

The Raw Materials Found Within the Sub-Region

Iron

A mine of ferrous sulphate ie., *zagh*, on the eastern slopes of the Nagau range, facing Sanni in Kacchi was mentioned in the 1907 edition of the Sarawan district gazetteer (Minchin 1907c:135). The extracted mineral, incidentally, was used for making a black dye and for graining swords (Minchin 1907c:136). The Kachhi district gazetteer (Minchin 1907c:122) also noted the presence of *zagh* in the bed of the Mukhali stream about three miles west of Gajan and near Kumbi west of Kotra.

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

Ceramic and Other Artefactual Links

The pottery and artefacts of Pirak seem to have no analogies with the published artefacts from contemporary sites of the period.

Discussion

Although Pirak, situated along a very important route to Kandahar and further west to Iran, has as many as eleven occupational levels together with impressive building activity including regular quadrangular buildings and streets, and evidence, albeit unspecified, in the preliminary report of the site, for craftsmen's activities (Jarrige and Enault 1973:169, 170), we are not aware of any evidence that could suggest intra-or interregional links. Although clear links between north-west India and the Gangetic valley and Iran (including in the Kandahar region), are evident in the first phase of the early

historic, these were clearly not articulated through Baluchistan and the Bolan Pass, in contrast to the protohistoric period.

East Rajasthan

This is the heartland of Matsya or Machchha janapada as the *Anguttara Nikaya* noted in its list of 'Solasa Mahajanapadas' (cited in Shukla 1978: 12), which is supposed to have included the whole of present Alwar, with portions of Jaipur and Bharatpur. In the archaeological sequence, there seems to be a continuity from the chalcolithic horizon into the Painted Grey ware level (P.G.W.). The following N.B.P. phase probably coincided with the Mauryan presence there which is testified to by the two Asokan rock edicts in the vicinity of Bairat and other Mauryan antiquities at sites like Bairat (Sahni n.d.) and Rairh (Puri n.d.). In the post-Mauryan period, the invasion by the Indo-Greeks of Matsyadesha, referred to by Patanjali (*Mahabhashya*, III, 2. III cited in Shukla 1978:22) is suggested by the discovery of Indo-Greek coins.

The Sitewise Distribution of Raw Materials

Chart 43 outlines the raw materials used at the sites of the sub-region. Briefly, these are iron, copper, lead, silver, gold, sandstone, quartzite, gneiss, slate, crystal, carnelian, agate, shell, onyx, chalcedony, amethyst, turquoise, lapis lazuli, beryl, aquamarine, ivory and steatite.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Significant evidence of iron-smelting and manufacture is available from a number of sites. Two furnaces for smelting and forging iron objects were also found at Sonari in the early phase of the P.G.W. there (*I.A.R.* 1980–1:56). At Noh, crucibles were found in Period III (*I.A.R.* 1980–1:56). At Rairh, large quantities of slag, which, according to the excavator (Puri n.d.:35), weighed several maunds, and 'traces of numerous smithies' suggested an important metallurgical centre. Iron slag was also found on the section cut near the road between Aguncha and Bhilwara (*I.A.R.* 1980–1:55). Although large quantities of slag were found at Ahar (Sankalia et al. 1969), it was not found in the stratified context of Period II.

The Raw Materials Found Within the Sub-Region

The presence of copper, gold, silver, lead, steatite, lapis lazuli, ivory and different kinds of semi-precious stones in Rajasthan has already been noted (pp. 49, 77–78, 94, 276).

Chart 43

RAJASTHAN–THE PERIOD BETWEEN 1000 BC. AND 200BC

Raw Material	*Aguncha-Bhilwara*	*Sunari*	*Jodhpura*	*Noh*	*Nagari*	*Sambhar*	*Rairh*	*Bairat*	*Ahar*
Shell			bangles				bangles, beads, rings, antimony holders		bangle
Steatite							dice, vessels		
Ivory				hairpins			dice, rod		
Ordinary Stone					Slate image. Sandstone sculptures. Crystal bead		Rock crystal beads, ear pendants. Gneiss balls		Sandstone rubberstones. Quartz /Quartzite rubberstones
Semi-Precious Stone					Carnelian beads. Agate bead		Carnelian beads. Onyx beads. Chalcedony beads. Amethyst beads. Beryl beads. Aquamarine beads. Agate stone		
Lapis Lazuli							beads		
Turquoise							bead		

(Chart 43 contd.)

Raw Material	*Aguncha-Bhilwara*	*Sunari*	*Jodhpura*	*Noh*	*Nagari*	*Sambhar*	*Rairh*	*Bairat*	*Ahar*
Gold							coins, pin, bead		
Silver							coins		
Lead							ear pendants		
Copper/ Bronze		objects		beads, implements	tubes		coins, bangles, rings, ear pendants, antimony rods, bottles, mirror, bridle pieces, ladles		coins
Iron	slag	implements	implements including arrowhead, nails	pieces, dishes, arrowheads, spearheads, axe	arrowhead, bell, nails	hatchets, chisel, mouthpiece, daggers, sickles, crucibles, chisels, clasps, fish plates, braces, rings, door pivots, stirrup, bells, ladles, spoon, vessel, arrowheads, spearheads	slag, sword blades, spearheads, dagger, knives, arrowheads, sickles, axes, adzes, nails, door fittings, rings, chain fragment	clamps, nails, fishplates, chisel	arrowheads, ring

Iron

Iron ore has been found in a number of districts in this sub-region. The relevant occurrences are listed below.

Alwar district: The *Sketch of the Geology of Ulwur* (Hackett 1878:183) noted the occurrence of iron in large quantities at Rajgarh and Bhangarh. P.W. Powlett (1878:76) further noted that 'the manufacture of iron was in former times a great industry in the state, as is testified by the large hillocks of slag which are to be found in all directions. . .'

Udaipur district: Erskine (1908:53) noted a number of occurrences: in the range on the north-east and east, near Gangrar, about twelve miles north of Chittor, in the hills to the south between Bedawal-ka-pal and Anjani. Bhattacharya et al. (1987:530) noted mineralization at Nathera-ki-pal (sixty one kilometres south-east of Udaipur) and at Thur-Hunder (twenty kilometres north-west of Udaipur).

Jaipur district: Iron occurs near Khetri and at Karwar close to Hindaun (*The Imperial Gazetteer of India*, volume XIII 1908:391), and sixty-five kilometres north-east of Jaipur, around Nimla village (Bhattacharya et al. 1987:530).

Bhilwara district: Scattered fields of iron ore occur at Lamba (Bhattacharya et al. 1987:503).

The Raw Materials Available Outside the Sub-Region

AFGHANISTAN AND CENTRAL ASIA

The silver, gold and lapis lazuli occurrences have already been noted (pp. 28, 82).

PUNJAB PLAINS

The presence of alluvial gold in the Punjab Plains has been previously mentioned (p. 42).

MIDDLE GANGETIC PLAINS

The presence of Chunar sandstone in the Mirzapur district has already been noted (p. 222).

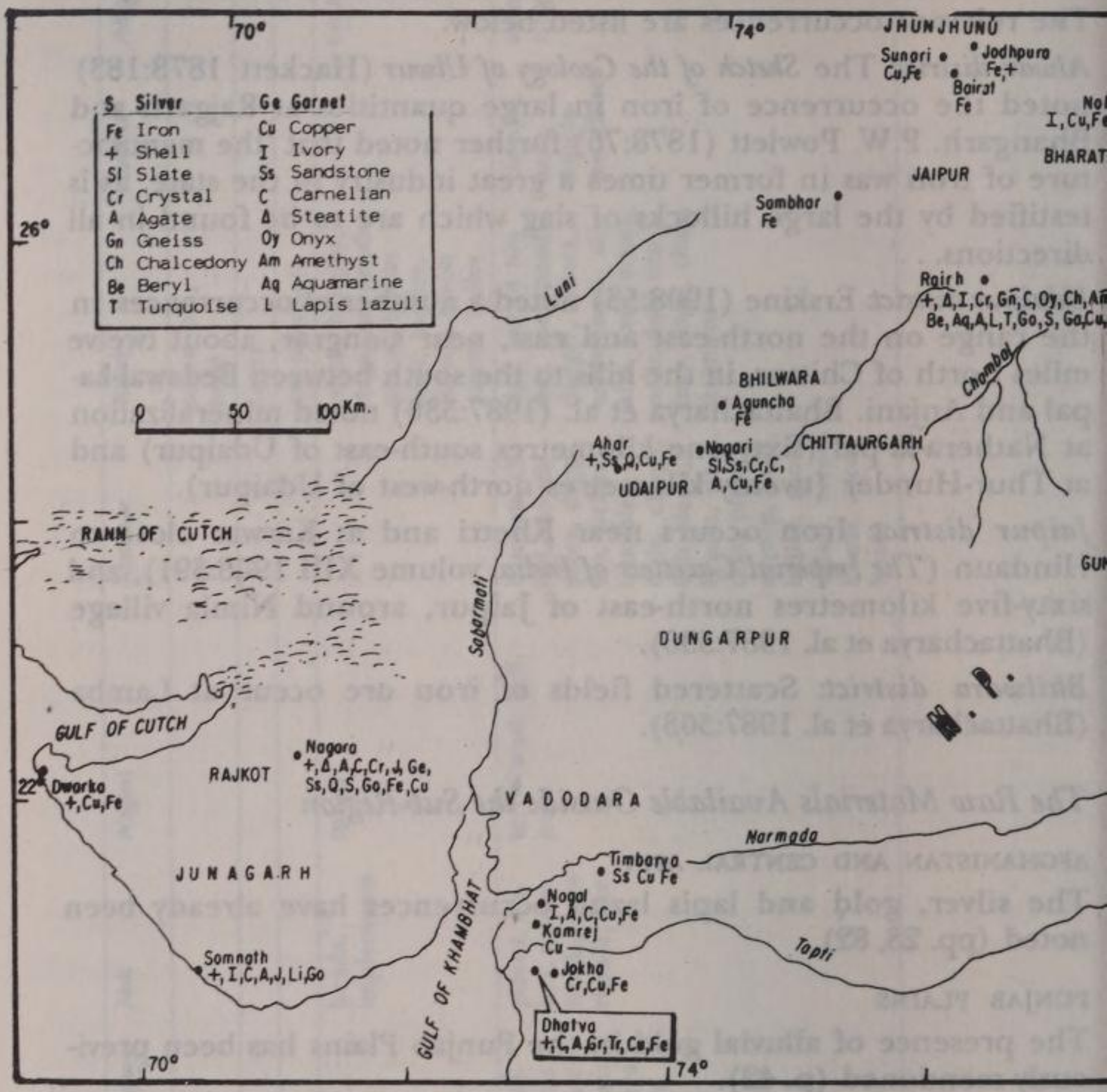
IRAN

The turquoise occurrences of the Nishapur mines are well known (Asthana 1982:274).

Ceramic and Other Artefactual Links

Rajasthan seems to share links, on the one hand, with the north-western portion of the Indian subcontinent and on the other, with the Gangetic plains.

Map 36



THE PERIOD BETWEEN 1000 B.C AND 200 B.C. - SITEWISE DISTRIBUTION OF RAW MATERIALS IN RAJASTHAN AND GUJARAT

The ceramic links with the Gangetic plains are evident in the occurrence of P.G.W. and N.B.P. wares in different districts of the sub-region. The largest number of P.G.W. sites is in the Bharatpur district (*I.A.R.* 1970–1:31; 1971–2:41; 1978–9:19; 1979–80:68; 1984–5:55). P.G.W. sites are also found in the Jhunjhunu (*I.A.R.* 1980–1:56), Alwar (*I.A.R.* 1976–7:79) and Jaipur districts (*I.A.R.* 1972–3:28–9; 1973–4:24). The N.B.P. phase is encountered in the Bhilwara (*I.A.R.* 1980–1:55), Jhunjhunu (*I.A.R.* 1980–1:56), Jaipur (*I.A.R.* 1972–3:29–30), Bharatpur (*I.A.R.* 1970–1:32; 1971–2: 42), Chittorgarh (*I.A.R.* 1962–3:20) and Ajmer (*I.A.R.* 1958–9:45) districts. The other significant artefacts in this context are (i) the fragment of a polished Chunar sandstone bowl, typical of the Mauryan period (Puri n.d.:4) and (ii) six Senapati coins which were found on the surface of the site of Rairh (Puri n.d.:51), bearing the legend 'Senapati Vachhaghosha' in the Brahmi script of the third-second centuries BC; it has been pointed out that Pusyamitra Sunga held the same rank (Puri n.d.:51).

Clearly emanating from the north-west, Indo-Greek coins have been recovered at Bairat, which has yielded twenty-eight silver coins, at Rairh where one silver coins was found, at Ahar where one copper coin was recovered and at Dada Fethpur where ten gold coins were found (cf. Pokharna 1982:7). Additionally, four coins of the Sibi-janapada have been found at Nagari (Bhandarkar 1920:123). The habitat of the Sibis seems to have been the Punjab, in particular, the central tract lying between Lahore and Multan. These coins could have come to Rajasthan either through trade or through the migration of a part of the tribe from Punjab (see Shukla 1978:23).

Discussion

Eastern Rajasthan's interaction with the Gangetic plains, as evidenced in the *Mahabharata* where the Kurus were said to have led predatory raids against the Matsya janapada, is clearly corroborated in the archaeological record, whether in the form of P.G.W. or N.B.P. pottery, Asokan edicts or Sunga type coins. The Bala Kanda of the *Ramayana* (Canto LXIII) which describes Visvamitra's migration and austerities at the Pushkara lake, incidentally, also underlines this connection. Towards the north-west of the subcontinent as well, clear links with the Indo-Greeks and the Sibi janapada are evident and, in all probability, the stray lapis lazuli and turquoise beads found at Rairh also trickled along from there. There is also no doubt that many of the semi-precious stones being used at Taxila were from Rajasthan. Much has been made of chrysoberyl ie., *vaidurya* in ancient Indian trade studies, with learned arguments, on the basis of literary and geological data, being advanced to

show it as being of south Indian provenance (cf. Ray 1986:29). On the basis of the presence of beryl in raw material form in Rajasthan and in the form of beads at Rairh and Taxila (both in an early historic context), one can clearly discount the probability of Coimbatore beryl being imported to the north-west.

Bahawalpur

In sharp contrast to the late Harappan period, where at least fifty sites with Cemetery H-related materials were found, in the post-Harappan period, only fourteen sites have been found in the Bahawalpur tract where the classic P.G.W. ceramic is only five per cent, at the most, of the total surface collections from any site (Mughal 1982:93). The concentration of these sites is in the middle of the former Hakra river bed ie., in north-eastern Cholistan. No details are available on the other artefacts present at the sites. This area, however, is full of the Kushan 'Rangmahal' material, but none dates from before the second century BC.

Indo-Gangetic Divide

This region was the geographical focus of the *Bharatayuddha-Katha*, the great *Mahabharata* being fought out on the plains of Kurukshetra (cf. Bhardwaj 1979). It was, in fact, one of the most crucial regions in the first phase of the early historic, marking as Niharranjan Ray (1976:xii) put it, 'the great divide between the traditional Uttarapatha and the traditional Madhyadesa, the former comprising the North West Frontier Province and the Punjab of old and the latter, the entire Ganga-Yamuna valley.' In the archaeological sequence, this period marks the large-scale use of iron in the Indo-Gangetic divide which coincides with the P.G.W. culture which, as the evidence from Bhagwanpura IB and Dadheri IB suggests, was coexisting with the last phase of the late Harappan complex there. The early historic phase in the region, which occupied basically the same geographical space, in its first phase, showed clear Mauryan association in the form of the presence of the N.B.P. ware, Mauryan sculpture etc. at important centres like Ropar and Sanghol, and the presence of an Asokan pillar edict at Topra Kalan (see Sharma 1953, 1964, 1981; Sharma and Kumar 1980). Indo-Greek coins have also been found at a number of sites such as Ropar, Theh Polar, Sugh, Ajaram etc.

Sitewise Distribution of Raw Materials

Chart 44 outlines the raw materials used. These include iron, copper, silver, ivory, shell, agate, and carnelian.

Chart 44

INDO-GANGETIC DIVIDE—THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Singh Bhagwanpur*	*Agroha*	*Daulatpur*	*Sanghol*	*Nagar*	*Ghuram*	*Rupar*	*Bhagwanpura*	*Purana Qila*	*Sugh*
Shell		objects	bangles			beads				
Ivory				bangle, combs, pieces						
Semi-Precious Stone			Carnelian beads			Agate beads Carnelian beads	beads			
Silver				coins	coin					coins
Copper/ Bronze		objects	bangles, bead, coins, antimony rod	antimony rods, coins	objects		coins, artefact	bangle, rods, indeterminate objects	coins, nail parers, sickles, antimony rods	coins, objects
Iron	clamp, slag, spear head, piece, tubular object	objects	blade fragments, sickle, nail, fragments, figure			pieces	pieces, implements			objects

The Evidence of Manufacture of Finished Products at Different Sites

Iron: The workshop of a smithy with mud walls and wooden posts at intervals was discovered at Ropar (III A). A furnace was also found with pieces of iron nearby (Sharma 1981:30). At Singh Bhagwanpur also, lumps of iron slag were found (*I.A.R.* 1980–1:51).

Gold: At Ghuram (IIA), a house supposedly of a goldsmith was found (*I.A.R.* 1976–7:44).

Coins: Coin moulds of Menander have been found at Ghuram (IIA) (*I.A.R.* 1976–7:44). Also a silver coin probably cast from the same type of mould was found.

Agate: A heap of agate beads, including a number of unfinished specimens, were found near a furnace at Ropar (Sharma 1981:30).

The Raw Materials Found Within the Sub-Region

The presence of copper in the sub-region has already been noted (p. 52–53).

Ivory

Considering that a large section of this sub-region was under a forest cover in this period, elephants must have been part of the local fauna.

Iron

Jauhari and Verma (1987: 93) have noted the presence of small deposits of iron ore of an average iron content of 57 per cent in the hilly regions, especially the Aravalli tract of the south. They are found in the Dhanauta-Dhancholi area and near Narnaul.

The Raw Materials Available Outside the Sub-Region

RAJASTHAN

The carnelian, agate, silver, copper, and iron ore occurrences have already been noted (pp. 49, 77–78, 155–56, 287).

SIND

The presence of shell on the coast of Sind has already been noted (p. 22).

AFGHANISTAN AND CENTRAL ASIA

The presence of silver has already been noted there (p. 28).

Ceramic and Other Artefactual Links

The Indo-Gangetic divide was involved, on the one hand, with the Gangetic plains and, on the other, with the north-west.

Among other things, the links with the Indo-Gangetic plains are exemplified by the presence of P.G.W. and N.B.P. wares. The P.G.W. horizon is spatially very wide, including within its ambit the Sirsa, Ludhiana, Ropar, Hissar, Ambala, Jind, Rohtak, Patiala, Kurukshetra, Sangrur, Amritsar, Faridkot, Gurdaspur, Jullundur, and Bhatinda districts and the Union territories of Chandigarh and Delhi (*I.A.R.* 1983–4:31, 67–9; 1980–1:46, 49, 51; 1979–80:31, 46, 61; 1978–9:8, 18–19; 1977–8:23, 41, 42, 45; 1975–6:38; 1969–70:4). The N.B.P. horizon is found in broadly the same districts. At Ropar (III), five hundred N.B.P. sherds were found and its worth as a deluxe pottery can be judged from the fact that broken N.B.P. vessels were found at the site joined with copper wire. At Ghuram, in addition to a limited quantity of N.B.P. pottery, Sunga stamped pottery was also recovered from the surface (Sharma and Kumar 1980:32, 33).

Coins of Taxila have been found at Ajaram in Hoshiarpur district (*I.A.R.* 1969–70:31). At Ropar (III), punchmarked and uninscribed cast coins, some with Taxila symbols, were found (Sharma 1953:23). Ropar (III) also yielded a fine broken stone disc minutely carved with the figure of a goddess of fertility, possibly to be identified with Aditi or Shri, according to Y.D. Sharma (1964:48) and, in his opinion, recalling similar stones from Taxila and Patna. Indo-Greek coins have been found at the following sites: Ajaram (*I.A.R.* 1969–70:31), Sugh (IB) (*I.A.R.* 1965–6:35–6), Ropar (IV) (Sharma 1964:49) and Theh Polar (Sharma 1953:30).

Discussion

The links between the the Indo-Gangetic divide and the Gangetic plains, for the first time, become primary in contrast with the earlier periods where strains from the Indus valley were predominant. These links are to be seen in the broadly common ceramic traditions of the two regions, the P.G.W. and the N.B.P. ware, as well as in the political authority of the Mauryan emperor, Asoka, symbolized by the Topra pillar edict. No doubt, its transitional geographical character as a marchland towards the north-west, where there is a significant Mauryan presence, was among the primary factors that helped in cementing these cultural ties. Links with Taxila and the north-west are evident in the presence of coinage from that region, and further north, Afghanistan could have been supplying silver; this was used at Ghuram for minting coins. Alternatively, the

silver mines of Rajasthan could also have been the source of this precious metal for the eastern Punjab region.

Upper Gangetic Plains

The geographical epicentre of the two epics, the *Ramayana* and the *Mahabharata*, the rivalries and episodes of which have defined perceptions of India in antiquity, the upper Gangetic plains are dotted with relics of the ancient tradition: Mathura, the land of the Yadavas, indelibly associated with the life of Krishna, a tradition confirmed by the *Ghata Jataka*; Hastinapur, the capital of the Kauravas; Sahet and Mahet, 100 miles off Lucknow, identified with the Jetavana monastery and the ancient city of Sravasti respectively; Chakranagar, in the Etawah district, identified locally with the ancient Ekachakra of the *Mahavamsa*; Pariyar, in the Unnao district, where Sita was exiled by Rama and abandoned by Lakshman; Ayodhya, the capital of Kosala, and Kampilya, in Farukkhabad district, where Draupadi's *syayamvara* took place are some of them.

In the archaeological record, we find P.G.W. sites, often containing iron artefacts in their repertoire, spread over a large number of districts; Saharanpur, Bijnor, Mathura, Agra, Farukhabad, Mainpuri, Meerut, Etawah, Budaun, Unnao, Hardoi, Muzaffarnagar, Etah, Moradabad, Bulandshahr, Lucknow and Aligarh (*I.A.R.* 1984–4:92; 1982–3:95, 99; 1981–2:70, 74, 100, 102, 103; 1980–1:37; 1967–8:47; 1966–7:33; 1963–4:53; Singh 1979; Singh and Singh 1972). The subsequent N.B.P. horizon covered all the above districts, with, however, a much greater concentration of sites (see Lal 1984a, 1984b). Among the important excavated sites of the region, one may mention Hastinapur (Lal 1954–5), Ahicchhatra (Dikshit 1952; Ghosh and Panigrahi 1946; Agrawala 1947–8), Hulas (*I.A.R.* 1981–2, 1980–1 and 1978–9), Ayodhya (*I.A.R.* 1979–80, 1969–70), Sravasti (Vogel 1911; Sinha 1967), Atranjikhera (Gaur 1983), Mathura (Piggott 1945; I.A.R. 1973–4; Joshi and Sinha 1978–9; Lal 1985) Sonkh (Hartel 1976), Jakhera (*I.A.R.* 1974–5, 1975–6), Jajmau (*I.A.R.* 1976–7), Sankisa (Shastri 1927), Pariyar (Shukla 1986), Chakranagar (*A.R.A.S.I.* 1923–4) and Alamgirpur (I.A.R. 1958–9).

The Sitewise Distribution of Raw Materials

Charts 45a-b outline the range of raw materials used. These include gold, silver, copper/bronze, lead, iron, chalcedony, carnelian, agate, jasper, amethyst, serpentine, quartz, crystal, lapis lazuli, topaz, ivory, steatite, shell, sandstone, slatestone, limestone, marble, chert, and soapstone.

Chart 45 a

UPPER GANGETIC PLAINS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Ahichchhatra*	*Hastinapur*	*Hulas*	*Ayodhya*	*Pariyar*	*Issopur*	*Jajmau*	*Jakhera*	*Mathura*	*Sonkh*
Steatite						pieces		beads		
Ivory			beads			objects	bangles		beads	
Shell									seal, fragment	
Ordinary Stone	Quartz beads	Quartz beads. Chert weight. Slate whetstone. Sandstone pestle fragment		Crystal pendants, beads			Crystal beads, pendants	Quartz cores. Crystal beads		
Semi-Precious Stone	Carnelian beads. Agate beads. Chalcedony beads. Amethyst bead. Serpentine pendant	Chalcedony rings. Carnelian beads. Agate beads. Jasper bead, weight	Carnelian beads	Agate weight. Jasper weight. Chalcedony weight			Carnelian beads, pendants. Agate beads, pendants	Jasper cores. Agate, Carnelian, Amethyst beads	Topaz, Amethyst beads	
Silver		coins								coins

(Chart 45a contd.)

Raw Material	*Ahichchhatra*	*Hastinapur*	*Hulas*	*Ayodhya*	*Pariyar*	*Issopur*	*Jajmau*	*Jakhera*	*Mathura*	*Sonkh*
Copper/ Bronze	beads	arrowheads, beads, nail parer, borer, bangle, antimony rod, latch, fragmentary objects, ferrule, ring, reel, coins	antimony rods	beads	antimony rods	pieces	coins	antimony rods, needle, fragments, bangles, indeterminate objects, bangle fragments	coins	coins, trisula
Iron		arrowheads, chisel, sickle blade	spearhead, slag	objects			hooks, rings, nails, arrowheads, spear heads	ploughshare, rod, axe, spearheads, sickle fragments, arrowheads, dagger, chisels, nails, lumps, slag, knife fragments, sockets	spearhead	

Chart 45 b

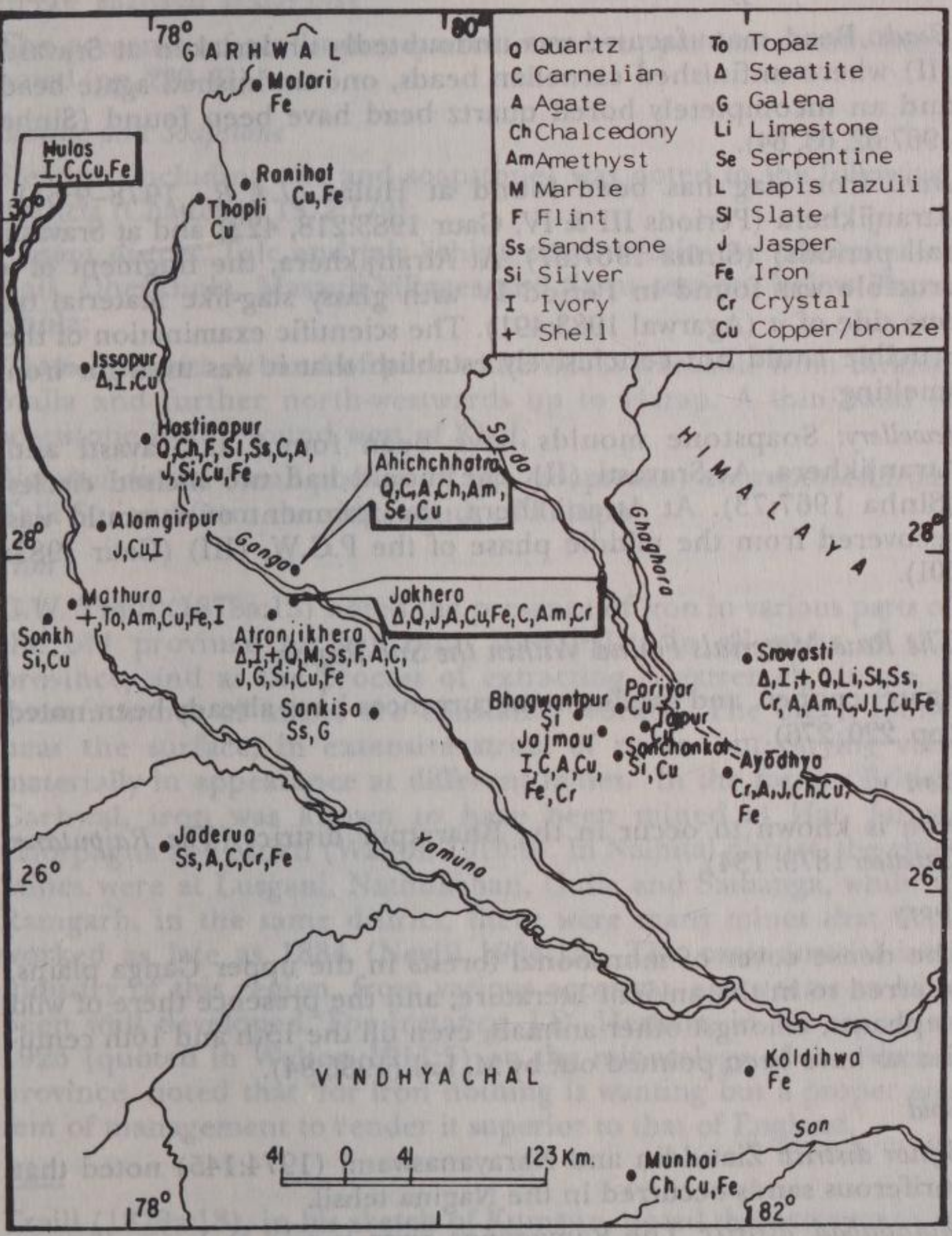
UPPER GANGETIC PLAINS—THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Sankisa*	*Sanchankot*	*Bhagwantpur Godapali*	*Tajpur*	*Sravasti*	*Atranjikhera*	*Alamgirpur*
Soapstone					mould	bead	
Ivory					arrowheads	ear stud, objects	
Shell					bead, pendant	fragment	
Ordinary Stone	Sandstone fragments				Quartz bead. Limestone bead. Slate sharpener. Sandstone pestles. Crystal bead	Quartz beads. Marble beads. Sandstone pestles, balls, indeterminate objects, whetstone, grinders, querns, disc. Chert core	
Semi-Precious Stone					Agate beads, bangles, discs, Amethyst beads. Carnelian beads, pendant, amulet. Jasper bead	Agate beads. Carnelian beads. Jasper reels	Jasper reels
Lapis Lazuli					bead		
Lead	coin					ball	
Silver		coins	coins			coins	

(Chart 45b contd.)

Raw Material	*Sankisa*	*Sanchankot*	*Bhagwantpur Godapali*	*Tajpur*	*Sravasti*	*Atranjikhera*	*Alamgirpur*
Copper/ Bronze		coins		ring, vessel	beads, coins, antimony rod, needle, pins, pendant, nail parer, borer, ring, earring, bangle, brooch	wire, antimony rods, coins, nail parers, pins, anklet, bangles, rings, ear-ornament, beads, socket	objects
Iron					slag, indeterminate objects, goad, knife blades, spearhead, arrowheads, chisel, nail, floox socket fragment	slag, indeterminate objects, arrowheads, spearheads, shafts, tongs, clamps, nails, bars, hooks, borers, chisels, needle, axes, knives, bangles, sickles, spuds, plough-share, hoe, dagger, ring fasteners, staples, bolets, plumb-bobs, choppers, pipes, scrapers, lid, discs	spearhead, arrowhead, nails

Map 37



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE UPPER GANGETIC PLAINS, THE U.P. HIMALAYAS AND THE VINDHYACHAL PLATEAU

The Evidence of Manufacture of Finished Products at Different Sites

Beads: Bead manufacture was undoubtedly undertaken at Sravasti (II) where unfinished carnelian beads, one unfinished agate bead and an incompletely bored quartz bead have been found (Sinha 1967:62, 63, 64).

Iron: Iron slag has been found at Hulas (*I.A.R.* 1978–9:61), Atranjikhera (Periods III & IV, Gaur 1983:218, 422) and at Sravasti (all periods) (Sinha 1967:67). At Atranjikhera, the fragment of a crucible was found in Period IV with glassy slag-like material on one side of it (Agarwal 1983:491). The scientific examination of the crucible could not conclusively establish that it was used for iron smelting.

Jewellery: Soapstone moulds have been found at Sravasti and Atranjikhera. At Sravasti (II), the mould had two incised circles (Sinha 1967:73). At Atranjikhera, the fragment of a mould was recovered from the middle phase of the P.G.W. (III) (Gaur 1983: 501).

The Raw Materials Found Within the Sub-Region

Agate, copper, and sandstone occurrences have already been noted (pp. 220, 276).

Iron

Iron is known to occur in the Bharatpur district (*The Rajputana Gazetteer* 1879: 134).

Ivory

The dense cover of monsoonal forests in the upper Ganga plains, referred to in the ancient literature, and the presence there of wild elephants, amongst other animals, even till the 15th and 16th centuries AD have been pointed out by M. Lal (1986:84).

Gold

Bijnor district: Ziauddin and Narayanaswami (1974:145) noted that auriferous sands occurred in the Nagina tehsil.

Moradabad district: The Ramaganga river is said to be auriferous below its junction with the Sona (Ziauddin and Narayanaswami 1974:146).

The Raw Materials Available Outside the Sub-Region

UTTAR PRADESH HIMALAYAS

The presence of sandstone, quartzite and copper has already been noted (pp. 220–21).

Steatite and Soapstone

Steatite (including talc and soapstone) was noted in the following districts (Chatterjee 1972:179):

Almora district: Talc and talc schists occur within the dolomites of Nail, Dherkhola, Masauli villages and Sarju section, below Pagna Khola;

Chamoli district: A band of pure white talc is traceable from Birkhal Malla and further north-westwards up to Harap. A thin band of soapstone is also found west of Khal;

Nainital district: Small pockets of talc (soapstone) are reported from Talli Sui and from the ridge south of Kalagar.

Iron

G.W. Traill (1878a:13) noted the presence of iron in various parts of the old province of Kumaun: 'Iron exists in all parts of the province, and as the process of extracting is extremely simple, a great number of mines are constantly worked. The ore is found near the surface, in extensive strata of rocks, but varying very materially in appearance at different mines.' In the former British Garhwal, iron was known to have been mined at Hat, Jainal, Chorpagna and Mokh (Walton 1910:9). In Nainital district, the chief mines were at Lusgani, Nathuakhan, Gulla and Satbanga, while at Ramgarh, in the same district, there were many mines that were worked as late as 1884 (Nevill 1904:15). The preindustrial iron industry of this region, from various accounts, also seems to have been well developed. For instance, J.D. Herbert, in his report in 1926 (quoted in Walton 1911:5) on the mineralogy of the Almora province, noted that 'for iron nothing is wanting but a proper system of management to render it superior to that of England.'

Lead

Traill (1878a:13), in his sketch of Kumaun, noted the occurrence of lead mines there, although their specific locations are not given. The following localities were mentioned by R. Nanda and D.K. Chakrabarti (1981:3): Dhanpur, Tachirda, Gherti, Rallum Bainskum, Baidili Baghir and Gaull in Patti Karahi.

Gold

The presence of alluvial gold washing in the Uttar Pradesh Himalayas has been noted (Coggin Brown and Dey 1955:134;

Walton 1910:10; Nevill 1904:15). In Nainital, a small amount of gold was obtained by washing from the sands of the Dhela river (Nevill 1904:15). In the former British Garhwal district, gold was washed in the Alaknanda river where Walton (1910:10) estimated that four *annas* a day could be made by an average worker. A more recent survey by the Geological Survey of India (Lal et al. 1985:22–4) noted a number of auriferous occurrences in the bed rock, stream sediments, terraces and palaeochannels of the Siwalik belt of the western Himalayas. It is significant that in the area between Ramnagar and Ranibagh (Nainital district) gold was found in the pebbly sandrock horizons (with a gold content of 0. 00001-0. 00068 gm per tonne).

Silver

Recently, argentiferous lead mineralization has been noted in the Pauri-Garhwal district (Kumar and Dhaundiyal 1977:5–8; Shrivastava and Kapoor 1981:8–12). G. Kumar and J.N. Dhaundiyal found large fragments of galena and galena bearing rocks, a grab sample of which showed on analysis to have 0.9 per cent of silver. R.N. Shrivastava and A.K. Kapoor noted *in situ* mineralization, for the first time, in the same area. The galena samples showed the presence of silver up to 0.10 per cent, which, according to the authors, made the area a potential zone for the occurrence of silver mineralization.

Ordinary Stone

Crystal: The southern and middle regions of the old Kumaun province are known to contain nodules of quartz (Traill 1878b:13). Traill (1878a:70), for instance, noted that in that region 'rock crystal is common, and specimens of considerable magnitude are occasionally procured.'

Slate: Slates are quarried at many places in the outer Himalayas of Kumaun and Garhwal which, incidentally, provide good roofing material to the hill towns and villages (Coggin Brown & Dey 1955: 319).

Limestone: In Garhwal, there are three distinct ranges of limestone hills (Walton 1910:10): (i) north of the Alaknanda in Nagpur, (ii) from Lohba *patti* to the Pindar and again to the Alaknanda in Bachhansyun and, (iii) a range running parallel to the plains and south of the Nayar river. In the Nainital district, the most important limestone deposits are those in the Kotah Bhabar and in the Timilia sot (Nevill 1904:13). Limestone is also recorded from the Mandarsu area of Dehradun district (Pant and Mishra 1983: 179).

THE VINDHYAN REGION

The presence of copper, agate, carnelian, chert, sandstone and quartz have already been mentioned (pp. 221–22, 232).

Iron

Banda district: Iron used to be extensively worked in tehsil Karwi near Manikpur (Brockman 1909:29–30):

> The works are managed by a company of *lohars*, who pay nothing to the zamindars for the right of digging the raw ore, but a sum of four rupees per kiln per season. . . . The mines are situated on the top of a hill at Gobarhai, about one and a half miles from the smelting works. The mass of the hill consists of sandstone, but the top is ferruginous; deep shafts are sunk and extensive passages are burrowed in the hill, as the ore lies at a distance of many feet from the surface. There are also mines at Deori and Rajauhan. . .

Mirzapur district: Beds of iron ore are met with most noticeably near Koelkat, but also in Dudhi and Agori (Drake Brockman 1911: 24–5). The iron smelting at the beginning of the century used to be carried on by an aboriginal tribe called Agaria and the iron produced used to have a high reputation for tenacity and endurance.

Serpentine

In the Mirzapur district, interbanded with limestones is occasionally found serpentine of a rich green colour (Drake Brockman 1911:23).

MIDDLE GANGETIC PLAINS

Silver

Much of the lead ore of Bhagalpur occurs in Sahrui, Chandan, Katuriya and Danra Sukhwara: it is a major mineral product of the region, and is argentiferous (Hunter volume xiv, 1877 reprint 1976: 39).

LOWER GANGETIC PLAINS

The presence of steatite in the lower Gangetic plains has already been noted (p. 234).

Amethyst

Amethyst occurs in the Rajmahal traps as, for instance, with chalcedony in the basalts, two miles west of Burhait in the Santal Parganas (Coggin Brown & Dey 1955:62).

Topaz

The topaz occurrences in Singhbhum and the old Dhalbum district are noted in Coggin Brown and Dey (1955:594). Firstly, it occurs freely with certain rocks of the 'kyanite belt' of Singhbhum. In the vicinity of Kanyaluka and Ghagidih, in the old Dhalbhum subdivision also, occurrences have been noted.

Silver

In the Santal Parganas, some silver ore was dug up in 1850 by Captain Sherwill in Deoghar (Hunter, volume XIV, 1877:272). Fourteen pounds of this ore that were treated in Calcutta by H. Piddington, the then curator of the Museum of Economic Geology, yielded 154 grains of pure silver, which was far above the yield of average ore.

Shell

The presence of sea shell on the eastern coast has already been noted (p. 193).

RAJASTHAN

The silver deposits in Rajasthan have already been noted, especially those of the Zawar mines of the Udaipur district (p. 78). The presence of a number of semi-precious stones and the possible occurrence of lapis lazuli have also been noted (pp. 49, 78).

AFGHANISTAN

Lapis lazuli and silver occurrence have already been noted (p. 28).

Ceramic and Other Artefactual Links

The basic affinity of the upper Gangetic plains, whether in pottery, as exemplified by the presence of P.G.W. or the N.B.P. Wares, or in other kinds of artefacts such as coins, is with the middle Gangetic plains. A detailed listing of all non-local coins is beyond the scope of this book. However, to give only one instance, at Sanchankot a coin with Caduceus and tree in railing as well as the legend 'Jethamitasa' on the obverse, and a standing bull to the right on the reverse was noted which, according to K.D. Bajpai, is a Kausambi coin (cf. Shukla 1986:87).

Discussion

Different segments of the upper Gangetic plains procured raw materials from a number of different sub-regions. Firstly, Mathura and Hastinapur relied on the resource base of copper, iron and siliceous semi-precious stones available in Bharatpur and its adjacent regions. Secondly, Ahichchhatra and Hulas, among other sites, procured copper, iron, slate, quartz etc. from the Himalayas to their north as well as serpentine, chalcedony and its allied semi-precious stones from the Vindhyas. Amethyst, topaz and most of the metals used in the upper Gangetic plains were also available in the lower Gangetic plains. Thirdly, Atranjikhera, Sravasti, Pariyar, Jakhera etc., in continuation of the pattern of resource procurement established in the preceding period, maintained links with the

Vindhyas where most of the raw materials used in the upper Gangetic plains were available.

Uttar Pradesh Himalayas

Including within their ambit Uttarkhand, Kumaon and Dehradun, the Uttar Pradesh Himalayas, stretching from the Tons on the border of Himachal Pradesh to the Kali in Nepal right up to the Indo-Tibetan boundary (Singh 1983), came to be included for the first time in the general archaeological sequence of the Gangetic plains. The cultural material seems to be different in the various pockets of the sub-region. Malari, in the Chamoli district, sixty kilometres north-east of Joshimath in the context of a cave burial revealed iron arrowheads (*I.A.R.* 1982–3:95). In the Tehri and Nainital districts, P.G.W. and its associated types have been found at Thapli (Tehri Garhwal), Purola(Uttarkashi) and Kashipur (Nautiyal et al. 1978–9, 1986–7). Ranihat and Kashipur have also yielded N.B.P. pottery. In the Dehradun district, Bharat Mandir is characterized by a crude N.B.P. ware and other wares that have been dated to the second-first centuries BC context.

The Sitewise Distribution of Raw Materials

The raw materials used–iron and copper–are clear from Chart 46.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Iron slag has been found at Ranihat (IIA) (*I.A.R.* 1978–9:75).

The Raw Materials Found Within the Sub-Region

The extensive copper and iron mineralization of this sub-region has already been noted (pp. 220–21, 301).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

Ceramic and other Artefactual Links

The primary ceramic links seem to have been with the Gangetic plains. At Ranihat (Pd I), pottery comparable to the pre-Mauryan pottery found at Hastinapur, Sravasti and Kausambi was noted (*I.A.R.* 1978–9:75). The Thapli excavations seem to have also revealed a single phase culture of P.G.W. and its associated types, with P.G.W. forming 10 per cent of the total assemblage (Nautiyal

Chart 46

UTTAR PRADESH HIMALAYAS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Malari*	*Thapli*	*Ranihat*
Copper/ Bronze		bangles, nail parers	ring
Iron	arrowheads		arrowheads, needles, slag

et al. 1986–7:11–14). Furthermore, one of the shapes of the P.G.W. ie., a miniature vase with painting, is similar to a specimen from Atranjikhera (Nautiyal et al. 1986–7: 11). The subsequent N.B.P. pottery is found only in a crude fabric as seen at Ranihat and Bharat Mandir (*I.A.R.* 1978–9:75).

Discussion

In the absence of a neolithic-chalcolithic horizon in the Uttar Pradesh Himalayas, the presence of a P.G.W. cultural phase at Thapli and a full-fledged iron-bearing level associated with the N.B.P. at Ranihat, undoubtedly suggest strong cultural links with the Gangetic plains, the epicentre of both the P.G.W. and the N.B.P. The strong possibility of the copper, iron and other resources of this region being exploited by the Gangetic valley from the O.C.P./copper hoard horizon onwards has already been suggested. This association, in fact, may have been among the primary factors involved in the cultural developments that took place in the Kumaon Himalayas. The pre-industrial iron-smelting tradition of the sub-region also suggests such links. Walton (1910:9), for instance, noted that the Agarias or Lohars considered their traditional founder to be Kalia Lohar who is said to have forged the weapons of the Pandavas and to whom the Agarias offered five pieces of charcoal before starting work.

Middle Gangetic Plains

The sites of the middle Gangetic plains are known in the Buddhist Jaina and epic tradition in a variety of contexts. The Allahabad and Varanasi regions were dominated by Sringaverapura, which Rama Lakshmana and Sita are said to have crossed on their way to Chitrakuta, Kausambi where the physical presence of the Ghasitrama monastery mentioned in Buddhist literature as well as Bharadvaja's hermitage situated at the confluence of the Ganga and Yamuna rivers at Prayaga and other sites have been archaeologically established. Kapilavastu, one of the more important Buddhist pilgrimage points, was located in the Sarayupara region in eastern

Uttar Pradesh. The Magadha-Anga plain was dominated by Vaisali, located at Basarh, the capital of the Licchavvis, and Rajagriha and Kumrahar, both the one-time capitals of ancient Magadha.

The type-fossil of this region is the N.B.P. ware which, often with iron artefacts, has been found, in the Gorakhpur, Allahabad, Mirzapur, Fatehpur, Jaunpur, Azamgarh, Basti, Gorakhpur, Varanasi, Deoria, Gaya, Patna, Saran, Nawadah, Bhagalpur, Nalanda, Chapra, Muzaffarpur, Vaisali, Darbhanga, Rohtas, Madhubani, Shahabad, Monghyr and Purnea districts (*I.A.R.* 1984–5:10–12, 89–91; 1983–4:14, 86; 1982–3:15, 25, 91–2; 1980–1:8, 69; 1979–80:74–5; 1977–8:17; 1976–7:50–1; 1974–5:46, 68; 1972–3:7; 1971–2:49; 1969–70:38; 1965–6:11; 1961–2:5; 1954–5:61; Erdosy 1985:65–79). Among the excavated sites, one may mention Kausambi (Sharma 1968, 1969), Rajgir (Jackson 1917; Ghosh 1951; *I.A.R.* 1974–5), Rajghat (Narain 1976; Narain and Roy 1977), Prahladpur (Narain and Roy 1968), Kumrahar (Altekar and Misra 1959), Vaisali (Sinha and Roy 1916; Spooner 1917; Deva and Misra 1961; Kumar 1986), Lauriya Nandangarh (Dikshit 1940; Majumdar 1938), Bhita (Marshall 1915), Pataliputra (Spooner 1916; Kumar 1987), Oriup (Prasad 1987), Champa (Prasad 1987; *I.A.R.* 1982–3:15), Taradih (*I.A.R.* 1984–5:10–11), Maner (*I.A.R.* 1984–5: 11–12), Chirand (*I.A.R.* 1972–3:8), Sonpur (*I.A.R.* 1970–1:6), Ganwaria and Piprahwa (Srivastava 1986a, 1986b). Many megalithic shelters are also found in the Mirzapur district and since iron slag has been found associated with some of them, it is likely that they belong broadly to the same horizon (*I.A.R.* 1980–1:72).

The Sitewise Distribution of Raw Materials

Charts 47a–c outline the raw materials used in this sub-region. Briefly, they are shell, coral, ivory, steatite, copper, iron, silver, gold, agate, serpentine, schist, trap, marble, chalcedony, jasper, carnelian, sardonyx, heliotrope, lapis lazuli, onyx, crystal, topaz, garnet, amethyst, sandstone, chert, slate, basalt, quartz and soapstone.

The Evidence of Manufacture of Finished Products at Different Sites

Beads: Evidence of bead manufacture is available from Rajghat, Prahladpur, Diha, Vaisali, Muzaffarpur and Ganwaria. Rajghat (I) has yielded seven unfinished agate beads while at Prahladpur one unfinished agate bead was found (Narain and Roy 1977:23; Narain and Roy 1968:47). In Katragarh, Muzaffarnagar district (*I.A.R.* 1975–6:8), finished and unfinished beads of carnelian, jasper and crystal were found. At Vaisali (IB) channel-like furnaces, running

Chart 47 a

MIDDLE GANGETIC PLAINS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Narhan*	*Kheradih*	*Sohagaura*	*Takiaper*	*Diha*	*Deoria*	*Lauriya Nandangarh*	*Bhita*	*Sarai Mohana*	*Piprahwa*
Steatite								vases, slab, boxes		vases, casket, vessels
Coral										ornaments, beads
Ivory		beads						seal		
Ordinary Stone		Basalt touchstone, beads. Quartz beads	Crystal beads		Quartz pieces		Crystal beads	Serpentine finger ring. Sandstone coping stone, railing, capital		Crystal casket, beads
Semi-Precious Stone	Agate beads	Carnelian pendant, beads. Agate beads. Chalcedony bladelet	Carnelian beads. Agate beads		Agate pieces		Agate beads. Carnelian beads. Amethyst beads			Carnelian, Garnet, Topaz, Amethyst beads. Carnelian bird
Gold							leaves	leaf fragment, plate		leaf, bars, rolls, beads ornaments, disc, box
Silver		coin					ring, coins	coin		vessels, beads
Copper/ Bronze	vessel, coin, objects	coins, pendant, wire, amulet, ring, fragmentary pieces	coins, hooks, rods, nails	objects		antimony rod	coins	bangles, rod	objects	wire
Iron	chisel, nail, objects	slag, tools, nails, shovel	arrowheads	objects			nail, arrowhead	object	objects	

Chart 47 b

MIDDLE GANGETIC PLAINS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Masaon*	*Ganwaria*	*Rajghat*	*Prahladpur*	*Vaisali*	*Kumrahar*	*Oriup*	*Kausambi*
Steatite/ Soapstone		mould, bead, vessel			bead			bowl, fragment
Shell			beads, pendant	bead	beads			beads, bangles
Ivory	stylus	beads	bead		rod			comb, bangles
Coral		beads	beads		bead			
Ordinary Stone		Schist beads. Crystal bead, lid. Trap stone querns. Marble bangles. Sandstone bangles, querns, sharpener. Slate pencils	Chert beads. Crystal beads. Quartz beads, pendant	Crystal bead. Chert flake. Quartz core	Crystal beads. Quartz bead			Crystal beads
Semi-Precious Stone		Chalcedony beads. Carnelian beads. Agate beads. Onyx beads. Sardonyx beads. Amethyst bead. Heliotrope bead	Agate beads. Chalcedony beads. Carnelian beads. Jasper beads. Topaz bead. Amethyst bead	Agate beads. Carnelian beads. Jasper bead. Chalcedony chips, core, blade	Amethyst beads. Carnelian beads. Agate beads. Jasper beads, weight. Chalcedony bead. Topaz beads			Carnelian, Agate, Chalcedony, Garnet, Beryl, Jasper beads
Lapis Lazuli		beads	bead					
Silver		snake, ear stud		piece	coins			

(Chart 47 b contd.)

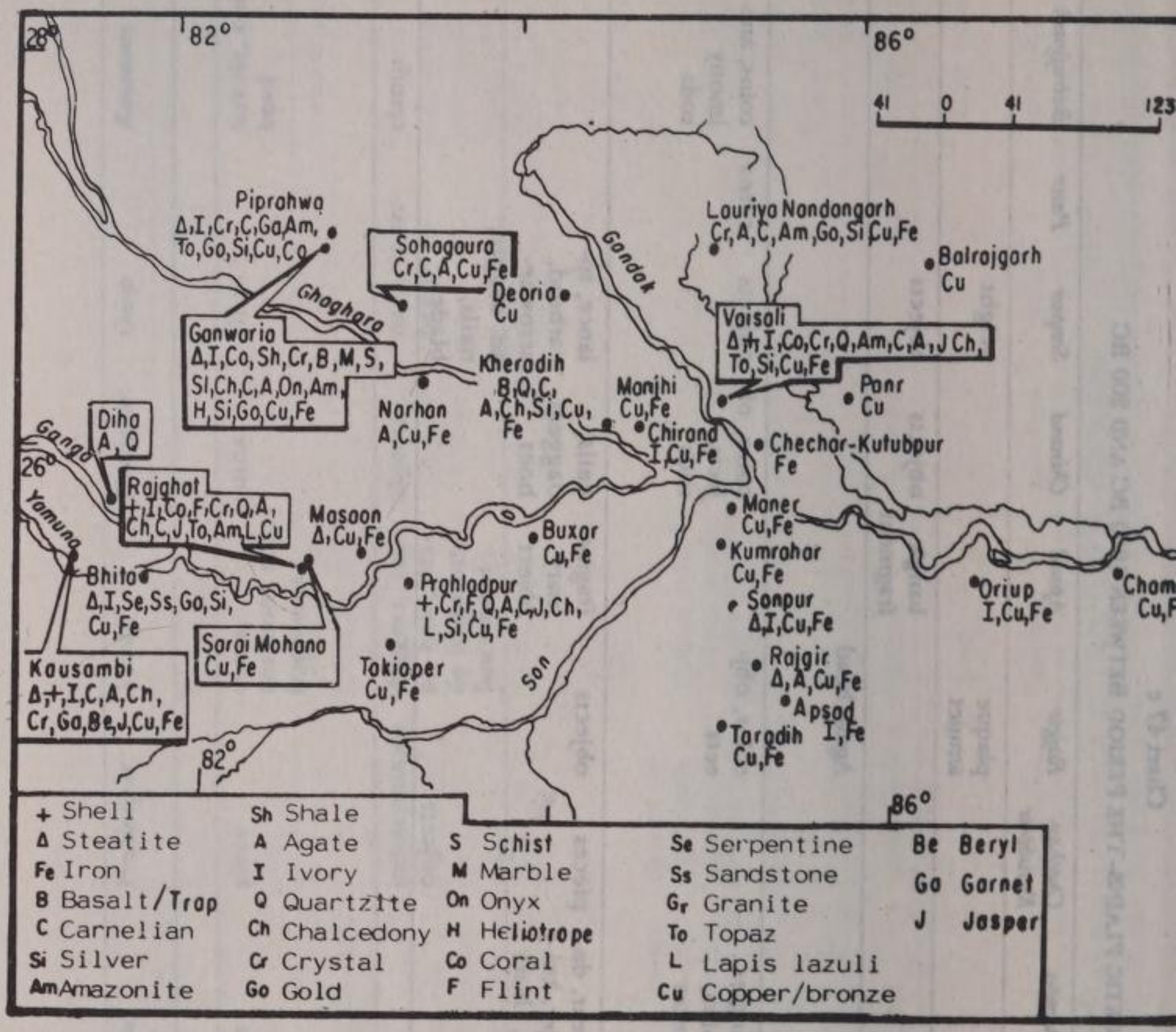
Raw Material	*Masaon*	*Ganwaria*	*Rajghat*	*Prahladpur*	*Vaisali*	*Kumrahar*	*Oriup*	*Kausambi*
Gold		wire						
Copper/ Bronze	coins, mirrors, pins, antimony rods, bangles	anklets, bangles, ring, beads, pendant, antimony rods, tooth-pick, styli, engravers, earstuds, armlets	beads	piece	coins, antimony rod, fragments	coins	rings	ferrule, coins, bead
Iron	arrowhead, spearpoint	ploughshares, sickl-les, khurpas, knives, nails, plates, horse-bits, styli, engravers		indeterminate objects	daggers, raz-or, knife, bla-de fragment, lance head	objects	nails, spear-heads	clamp

Chart 47 c

MIDDLE GANGETIC PLAINS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Taradih*	*Maner*	*Manjhi*	*Champa*	*Chechar-Kutubpur*	*Rajgir*	*Apsad*	*Chirand*	*Sonpur*	*Panr*	*Balrajgarh*	*Buxar*
Steatite						plaque amulet			weight			
Ivory							bangle fragment	objects	objects			
Semi-Precious Stone						Agate bead						
Copper/ Bronze	finger rings, ball, coin, beads, bangles, needle, rod, earring	bangles	bangle, coin, objects	bangles, coins, pieces		coins, objects		coins, objects, rods	objects	coins	coins, antimony rods	antimony rods
Iron	objects, slag, finger rings, nails, arrowheads, spearheads	spear, points, dagger, knife, chisel, nail	objects, slag	spear, dagger, knife, chisel	pieces	objects	fragmentary object	nails, daggers, hoes	lance, spearhead, arrowhead, dagger, nails, blades			implements

Map 38



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. - SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE MIDDLE GANGETIC PLAINS

parallel to each other, filled with burnt reddish sandy earth mixed with charcoal, were found (Deva and Mishra 1961:15). Although no associated material for bead manufacture was recovered, the excavators noted that similar furnaces unearthed at Ujjain were definitely known to have been used for the manufacture of beads. From Ganwaria (III) a sandstone bead polishing stone, with a number of channels on either side (probably grooves for polishing stones) was found (Srivastava 1986b:237). At Diha, pieces of quartz and banded agate were collected which, according to the excavators, may have been used as raw material for beads (*I.A.R.* 1969–70:38).

Iron: Kheradih, Ganwaria, Taradih, Champa, Balrajgarh, Manjhi and Koldihwa have revealed evidence of local iron smelting/working. At Kheradih (II), the excavators uncovered an 'iron smith's workshop' which, in the area around it, was strewn with iron slag (*I.A.R.* 1983–4: 86). Finished tools of iron and a large-sized trough containing a lot of ashy material and some glassy slag were also found in the workshop's vicinity. At Ganwaria, lumps of iron, interpreted as representing local smelting, were noted (Srivastava 1986b:228). Iron slags along with fragments of crucibles were found at Taradih (*I.A.R.* 1982–3:16). Champa and Balrajgarh also yielded crucibles (*I.A.R.* 1973–4:9; 1972–3:7). Manjhi yielded iron slag (*I.A.R.* 1967–8:9).

Jewellery: At Bhita, a coarse grey clay pot, called a 'jeweller's melting pot' by Marshall (1915:83), and a circular slab of steatite which, according to the excavator, may have been used for stamping gold medallions, were found (Marshall 1915:88). Ganwaria yielded a soapstone mould with two round perforations of equal diameter, interconnected by means of a channel, which Srivastava (1986b:237) has argued may have been a mould for use by a goldsmith.

Gold: At Kheradih, a goldsmith's basalt touchstone, with testmarks of gold on both sides, was found (*I.A.R.* 1982–3:93). The only other evidence comes from Bhita where a goldsmith's melting pot was found, although it is not clear how Marshall established its usage (Marshall 1915:41).

Shell: From Vaisali (II) an unfinished disc bead was recovered (Sinha and Roy 1969:174).

Ordinary Stone: A quartz core, chert waste chips and flakes were found at Prahladpur (Narain and Roy 1968:63, 64).

Semi-Precious Stone: Waste chips and a single fluted core of chalcedony were found at Prahladpur (Narain and Roy 1968:63).

The Raw Materials Found Within the Sub-Region

The presence of ivory, steatite, quartz, quartzite, sandstone, jasper, chalcedony, agate, chert, copper, and silver has already been noted (pp. 229, 231, 276, 303).

Iron

Bhagalpur district: W.W. Hunter (volume XIV, 1877:40) noted the distribution of iron ore all over the hilly tracts of the state, although he also added that it was not being used because of want of fuel and good flux.

Gold

Champaran district: At the beginning of the present century, gold used to be washed, albeit in minute quantities, from the Gandak river and from the Panchnad, Harha, Bhabsa and Sonaha hill streams (O'Malley 1907a:9).

Slate

In the Kharakpur hills of the Monghyr district, slates were probably worked since a very early period (Coggin Brown and Dey 1955:320). Slate is also found in the Rajgir hills (O'Malley 1907b:9).

The Raw Materials Available Outside the Sub-Region

LOWER GANGETIC PLAINS AND COAST

The presence of silver, carnelian, topaz, amethyst and shell has already been noted (pp. 193, 303–4, 234).

Gold

Singhbhum district and Gangpur: Alluvial gold is found in the Sanjai and Suvarnarekha valleys, while the only major auriferous quartz deposit is at Kundarkocha near the Mayurbhanj border (Chakrabarti and Chattopadhyay 1985:145). It is also interesting to note that stone implements made of hard rocks like felsite or quartzite are scattered over many parts of Singhbhum and Gangpur and were apparently used for crushing (O'Malley 1910a:147). O'Malley (1910a:149) also noted that 'near the scooped stones traces of old workings were almost invariably found, though often the amount of gold in the quartz and quartz shoadings would appear to be quite insufficient to account for the great numbers of grooved stones in the vicinity.' The native workers of the regions had no idea of their origin and explained them as *devlog ke patthar*.

Iron

Singhbhum district: Hunter (volume XVII 1877: 22) noted the presence of two kinds of iron deposits in Singhbhum: (i) a nodular form

found in most of the hill ranges of the district, and (ii) in the form of black earth, usually found in stratified masses, which had to be dug out and broken in pieces before smelting. In fact, various iron ore types apparently occur all over the Chhotanagpur block (Chakrabarti 1976:117).

VINDHYAN REGION

The presence of copper, sandstone, agate, carnelian, jasper and chalcedony has already been noted (pp. 221–22).

RAJASTHAN

The presence of semi-precious stones and possibly lapis lazuli has been already mentioned (pp. 49, 78, 155–56).

SOUTH INDIA

The literary evidence suggests that possibly some gold and silver were being procured from peninsular south India; gold, especially from the Kolar goldfield, has a large percentage of silver (see p. 205).

UPPER GANGETIC PLAINS

Basalt flows have been found in the Betwa bed, south of Sala village in the Jalaun district of Uttar Pradesh (Shrivastava and Saha 1975: 102).

AFGHANISTAN

The presence of lapis lazuli and silver has been previously mentioned (p. 28).

Ceramic and Other Artefactual Links

The distribution of N.B.P. sites in the various districts of this subregion has been outlined in the introduction to this section; this, in fact, is the type-fossil that is found in both the upper and the lower Gangetic plains. Additionally, some interregional links with the upper Gangetic plains are present at Vaisali, in the form of Painted Grey Ware (Singh and Roy 1969: 6). This has been found both from the N.B.P. ware level and from the mud rampart. Clearly, these pieces are, chronologically speaking, late and outside the distribution zone of the Painted Grey ware culture.

Discussion

Different segments of the middle Gangetic Plains were procuring minerals from different source areas. The Sarayupara region relied on the Uttar Pradesh Himalayas where, as already noted, an iron-bearing horizon with N.B.P. ware has been unearthed. Some of the semi-precious stones as well as the single basalt specimen at

Ganwaria were possibly from the Vindhyas and the Jalaun district. Rajasthan also is a significant storehouse of such semi-precious stones. The Magadha-Anga plain looked to the Singhbhum region for gold and iron, and to the Vindhyas for Chunar sandstone and for several chalcedonic varieties of stone. That interaction went also through the Gangetic plains towards the north-west up to Afghanistan, as evidenced in the ancient literature as well as from the distribution of Asokan epigraphs, is exemplified in the presence of lapis lazuli at several sites of the sub-region.

The Nepal Terai Region

The identification of Kapilavastu with Piparahwa in the Basti district notwithstanding, the Nepal *terai* seems to have been an important region in the geography of early Buddhism as the remains at Tilaurakot, Lumbini and Devadaha clearly suggest (Rijal 1979). As the excavations of the Department of Archaeology, Nepal (1970–1) make clear, Period I at Tilaurakot contained P.G.W. while Period II and III were N.B.P. bearing horizons (Rijal 1979:34). Punch marked coins in copper and silver are noteworthy in the artefactual remains from Tilaurakot.

The Vindhyachal Plateau

The earliest iron-bearing horizon in the Vindhyan plateau occurs in the context of a megalithic site at Kotia, on the right bank of the Belan river, and in the Sidhi district (*I.A.R.* 1963–4:40; 1982–3:58–9). Megaliths have also been found at Daiya, Bhahvar and Ismilia (Allahabad district), at Lalapur, Maraiyan and Pahra (Mirzapur district), at Amahata (Rewa district) and at Mairhar (Satna district). Iron has also been reported from Koldihwa (*I.A.R.* 1973–4:27). Additionally, a number of sites with N.B.P. have been noted in the Banda district such as Chitrakut, Ghatampur and Mahuapur-Chauthar (*I.A.R.* 1980–1:70; 1975–6:56) and at Jhar in the Rewa district (*I.A.R.* 1984–5:48). In Gwalior, an early historic level has been reported at Jaderua (*I.A.R.* 1971–2:29).

The Sitewise Distribution of Raw Materials

Chart 48 outlines the raw materials used. These include chalcedony, agate, carnelian, crystal, sandstone, copper and iron.

Chart 48

VINDHYACHAL PLATEAU–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Munhai*	*Jaderua*	*Koldihwa*
Ordinary Stone		Sandstone muller	
Semi-Precious Stone	Chalcedony micro-liths	Agate beads. Carnelian beads. Crystal beads	
Copper/Bronze	pieces, objects		
Iron	fragments, slag, objects	chisels, spearheads, sickle, slag	slag, axe, arrowheads

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Iron slag and a crucible have been reported from Koldihwa (*I.A.R.* 1973–4:27). Iron slag has also been reported from Munhai, Rewa district (*I.A.R.* 1980–1:38–9) and Jaderua, Gwalior district (*I.A.R.* 1971–2:29).

The Raw Materials Found Within the Sub-Region

The presence of chalcedony, other semi-precious stones, ordinary stones, copper and iron has already been noted (pp. 221–22, 232, 303).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

Ceramic and Other Artefactual Links

The Vindhyachal region shared some ceramic affinities with the middle Gangetic plains. At least three sites in the Banda district ie., Ghatampur, Mahuapur-Chauthar and Chitrakut seem to have N.B.P. pottery in their ceramic repertoires, as already noted. N.B.P. has also been found at Jhar and Jaderua.

Discussion

The importance of the Vindhyan plateau as a source-area of raw materials for the minerally poor Gangetic plains, going back to the mesolithic period, was greatly enhanced during the first phase of the early historic when the urban centres that dotted the plains demanded a large supply of iron, copper and stones of various kinds. This interaction is also evident in the presence of N.B.P. pottery at sites in the Vindhyas, and this region mediated interaction between the Gangetic valley and central and peninsular India.

Lower Gangetic Plains and the Chhotanagpur Plateau

The first phase of the early historic period in this sub-region, as in the preceding period, witnessed the presence of a number of sites in the Bankura, Burdwan, Birbhum, Midnapore and 24 Parganas districts (*I.A.R.* 1984–5:97; 1975–6:58; 1974–5:52; 1966–7:58). Additionally, in this phase important centres also came up in the Rajashahi and Bogra areas, many of which have been excavated such as Mahasthangarh, Sitakot and Bangarh (Goswami 1948; Ahmed 1975; Amzad Hossain Mian 1969). Mahathangarh, in fact, has been identified with Pundranagar, an identification strengthened by the discovery of an inscribed tablet which records the measures taken by the Mahamatra of Pundranagar to meet the famine there. Diggings at Pandu Rajar Dibi, Chandraketugarh, Mahisdal and Bahiri have also unearthed early historic remains (*I.A.R.* 1984–5:97; 1966–7:48; 1965–6:59; 1963–4:60; Chakrabarti and Hasan 1982; Chakrabarti 1985–6).

The Sitewise Distribution of Raw Materials

Chart 49 outlines the raw materials used. Briefly, these are agate, crystal, carnelian, jade, amethyst, bloodstone, flint, quartz, marble, lapis lazuli, ivory, shell, gold, silver, copper and iron.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Evidence of local smelting/working comes from two sites. From Mahisdal, iron ore and slag were found in large quantities (*I.A.R.* 1963–4:66). At Bahiri (I and II) there is evidence of iron smelting and working (Chakrabarti and Hasan 1982:122–3). In Period I, an extensive, thick deposit of iron ore and slag was observed. In Period II, apart from the slag, a terracotta crucible and piece of a nozzle of a terracotta turjere were found.

Silver: An unfinished silver rod was found at Bangarh which, according to Goswami (1948:17), was probably meant for the manufacture of ornaments.

Jewellery: At Bangarh, pottery crucibles meant for melting metals for jewellery were found (Goswami 1948:28).

Ordinary Stone: A quartz crystal chip was found in Bahiri (Chakrabarti and Hasan 1982:119).

Semi-Precious Stone: Waste chips of agate and carnelian were recovered from Bahiri (Chakrabarti and Hasan 1982:119).

Chart 49

LOWER GANGETIC PLAINS AND THE CHHOTANAGPUR PLATEUA–
THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Dihar*	*Pandu Rajar Dhibi*	*Bharatpur*	*Chandraketugarh*	*Mahisdal*	*Bahiri*	*Bangarh*
Ivory				bangles, beads, rods			comb
Shell							beads, bangles
Lapis Lazuli		fragmentary piece					
Jade							beads
Semi-Precious Stone						Agate chips. Carnelian chip	Carnelian beads. Agate beads. Amethyst beads. Bloodstone beads
Ordinary Stone						Crystal chip	Quartz beads. Marble beads. Flint celt
Gold							amulet, pendant
Silver				coins			rod, coins
Copper/ Bronze	antimony rods, coins	objects		coins, rods		ring	bangles, ring, amulet, sticks, awls, coins, beads
Iron	nail, dagger, swords	implement	implements		arrowheads, spearheads, chisels, nails, ore, slag	ore, slag	

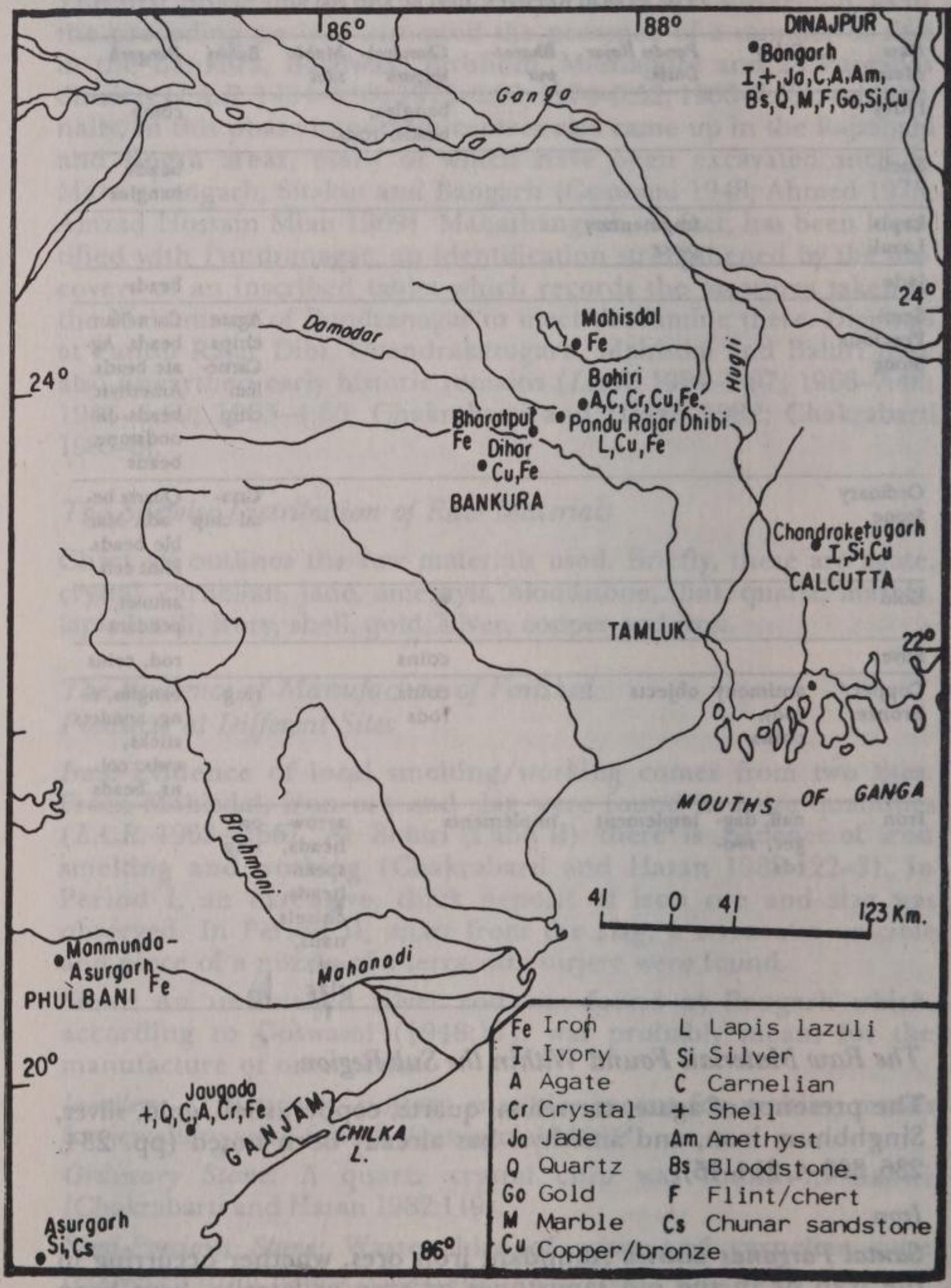
The Raw Materials Found Within the Sub-Region

The presence of agate, carnelian, quartz, copper, shell, gold, silver, Singhbhum iron, and amethyst has already been noted (pp. 234, 236, 303–4, 314–15).

Iron

Santal Parganas district: Abundant iron ores, whether occurring in the trap or in the old sandstones or even as laterite, have been noted (O'Malley 1910b:15).

Map 39



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN THE LOWER GANGETIC PLAINS AND ORISSA

Birbhum district: According to Hunter (volume IV, 1876, reprint 1973:318), iron ores in the district boasted of a long history of native extraction and smelting. A lateritic gravel spread has been noted at Muluk which, in the opinion of the excavators of Bahiri, could have supplied the lateritic ore for iron extraction, to that site (Chakrabarti and Hasan 1982:122).

Bankura district: The iron here is basically ferruginous laterite, of which there are abundant resources and which were worked by the Santhals and aboriginal tribes even in 1877 (Hunter, volume IV 1876:211).

Midnapore district: Iron is said to occur in this district (Hunter, volume II 1876:39).

Ivory

The elephant is part of the local fauna of the region (cf. Watt 1908: 697).

The Raw Materials Available Outside the Sub-Region

AFGHANISTAN

The presence of lapis lazuli and silver has already been noted (p. 28).

CHINA

The presence of jade has already been noted (pp. 78–9).

Ceramic and Other Artefactual Links

The basic affinity of this sub-region was with the middle Gangetic plains as evident in the N.B.P. pottery found at a number of sites: Pandu Rajar Dibi (v), Indrani, Mangalkot, Bharatpur and Raigram in Burdwan district (*I.A.R.* 1984–5:97; 1975–6:58; 1974–5:51), Saragdhi in Bankura district (*I.A.R.* 1975–6:57), Kotasur in Birbhum district (I.A.R. 1975–6:58), Tamluk and Tildah in Midnapore district (*I.A.R.* 1974–5:52; 1954–5:23), Chandraketugarh in 24 Parganas district (*I.A.R.* 1965–6:59), a number of mounds in the Sundergarh district in Orissa (I.A.R. 1984–5:61) Mahasthangarh in the Bogra district of Bangladesh (Ahmed 1975:30), Sitakot in the Dinajpur district of Bangladesh (Amzad Hossain Mian 1969:219), and Bangarh in the Rajshahi area (Goswami 1948:27). Additionally, Sunga wares have been found at Chandraketugarh (II) (*I.A.R.* 1965–6:59).

Discussion

The lower Gangetic plains were politically affiliated, in the period under discussion, to Magadha in the middle Gangetic region and also pro-

vided certain raw materials—amethyst, topaz, gold—along with raw materials of coastal origin; this seems to indicate a close interaction between the two regions in the early historic period. Deluxe N.B.P. pottery as well as Sunga terracottas and plaques (found at Mahasthangarh, Tamluk and Bahiri) formed part of the traffic from the middle Gangetic region.

Orissa Littoral Region

The Orissa division, geologically and geographically, is composed of two very distinct portions—a belt of nearly flat country, from fifteen to fifty miles in breadth extending along the coast on the one hand, and an undulating hilly area in the interior (Cobden Ramsay 1910:6). Since the latter is really a part of the Chhotanagpur plateau, the eastern deltaic plains are being discussed as a distinct sub-region. The major early historic sites in the Orissa plains, Sisupalgarh (Puri district) and Jaugada (Ganjam district), the first identified with the site of Kalinganagara, the metropolis of Kharavela, and the second traditionally ascribed to Duryodhana of the *Mahabharata* fame, occupied strategic locations as the presence of the Asokan inscriptions there suggests. Excavations have been conducted at the above-mentioned two sites (Lal 1949; Thapar 1976; see Mahapatra, Volumes I and II 1986; *I.A.R.* 1956–7:30). Early historic remains have also been reported from the Phulbani (*I.A.R.* 1984–5:59) and Kalahandi (*I.A.R.* 1972–3:27) districts.

The Sitewise Distribution of Raw Materials

Chart 50 outlines the raw materials exploited in the sub-region. These include carnelian, agate, crystal, quartz, shell, silver, iron and sandstone.

The Evidence of Manufacture of Finished Products at Different Sites

Beads: The prolific bead industry of Jaugada, in addition to a large number of carnelian, agate, crystal and quartz beads has also revealed a number of unfinished specimens (*I.A.R.* 1956–7:30).

The Raw Materials Found within the Sub-Region

Iron

The Singhbhum iron belt extends into Keonjhar and Bonai (Senapati and Kuanr 1975:18). Additionally, Cobden-Ramsay (1910: 9–10) noted that small pisolitic nodules, composed chiefly of hydrated oxide of iron (brown haematite), in the form of laterite, are found all over the states of Orissa; these are also often washed

Chart 50

ORISSA PLAINS–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Jaugada*	*Asurgarh*	*Manmuda Asurgarh*
Shell	beads		
Ordinary Stone	Quartz beads. Crystal beads	Chunar sandstone fragment	
Semi-Precious Stone	Carnelian beads. Agate beads		
Iron	objects		objects
Silver		coins	

from their matrix, and deposited in sufficient quantities in alluvial formations.

Quartz

In the Brahmani valley as well as in the Eastern Ghats group, quartzites have been noted (Cobden-Ramsey 1910:6; Senapati and Kuanr 1980:13).

The Raw Materials Available Outside the Sub-Region

ANDHRA COAST

Shell occurrences have already been noted (p. 193).

LOWER GANGETIC PLAINS AND THE CHHOTANAGPUR PLATEAU

The presence of carnelian, agate, and silver has already been noted (pp. 234, 304).

MIDDLE GANGETIC PLAINS

The presence of Chunar sandstone has already been noted (p. 222).

Ceramic and Other Artefactual Links

The basic affinity of the Orissa plains with the middle Gangetic valley is borne out by the presence of N.B.P. pottery at Sonepur (Bolangir district) and Sisupalgarh (Puri district) (cf. Kohli 1984: Appendix III).

Discussion

Mauryan political control/presence, as evidenced in the form of Asokan edicts at Jaugada and Dhauli, is authenticated by Mauryan silver punch-marked coins at Asurgarh. In fact, from the Kalinga edict it appears that a *Kumara* was in charge of Kalinga with his headquarters at Tosali. Additionally, Chunar sandstone was being brought in from Mirzapur along with raw materials from the Chhotanagpur plateau.

Central India

Central India, whether it is the fertile Malwa plateau, or the Ramgarh hill in Surguja or the relatively arid Bagelkhand section, was very much in the historical limelight with large Buddhist centres such as Bharhut and Sanchi, as well as a number of important urban centres such as Nagda, Tripuri, Maheshwar, Navdatoli and Ujjayini flourishing in the region. The Asokan rock edicts at Rupnath and near important sites like Nandur and Tripuri, substantiate the literary image of the region which is dominated by Mahismati, Vidisha, and the lands of the Chedis and Avanti, mentioned among the sixteen janapadas in the *Anguttara Nikaya*. The continuing importance of the region in the post-Mauryan period is also evident from the fact that Pusyamitra Sunga established a secondary capital at Vidisa, near Ujjain, with his son Agnimitra as viceroy, a viceroy who was the hero of Kalidasa's *Malavikagnimitra*.

Early historic remains have been reported from the Nimar, Mandla, Morena, Ujjain, Raisen, Guna, Sehore, Sagar, Mandasor, Jabalpur and Vidisa districts (*I.A.R.* 1984–5:44–6; 1983–4:52–3; 1981–2:36–7; 1975–5:30; 1972–3:16; 1970–1:66; 1963–4:16; 1959–60:24; Dikshit 1955; Sankalia et al. 1958). Among the sites that have been excavated, relevant data are available from Awra (Trivedi 1962), Kayatha (Ansari and Dhavalikar 1975), Besnagar (Bhandarkar 1917), Tripuri (Dikshit 1955) Nagda (Banerjee 1986), Maheshwar and Navdatoli (Sankalia et al. 1958).

The Sitewise Distribution of Raw Materials

Charts 51a–b outline the raw materials used. Briefly, these are iron, copper, lead, silver, gold, steatite, soapstone, shell, ivory, jasper, dyke, carnelian, chalcedony, agate, jasper, jade, amethyst, garnet, amazonite, quartz, crystal, onyx and trap.

The Evidence of Manufacture of Finished Products at Different Sites

Copper/Bronze: At Dangwada, a coppersmith's house with two furnaces, several broken crucibles with smelted pieces of copper, and some copper fragments were unearthed (*I.A.R.* 1982–3:59).

Iron: Lumps of heavily oxidized iron have been found at Maheshwar (Sankalia et al. 1958:211). Also, the rock shelter excavations of the Putli Karar group (Bhopal area) have yielded impressive evidence for iron working (Jacobsen 1975:88) that includes ores, slag, crucibles along with artefacts. The slag chunks were found on the rock shelter floors and almost all the glazed ceramic crucible fragments were discovered in one shelter.

Chart 51 a

CENTRAL INDIA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Atud Khas*	*Gilaub-khera*	*Dang-wada*	*Nand-aur*	*Run-ija*	*Besna-gar*	*Tum-ain*	*Eran*	*Putli Karar*
Shell		bangle fragment	bangles			objects		bangles, beads	
Ivory					beads				
Semi-Precious Stone		Carnelian bead		Carnelian bead				Jasper objects, weight	
Silver				coin					
Lead								piece	
Copper/ Bronze	coins, objects		coins, pieces, rod, ring pieces	coins	coins	nails, coins, bead	coins	objects, coins	
Iron	objects	lumps, nail, pot	objects		objects	objects	arrow-heads, spear-heads	objects	objects

Shell: Waste fragments, including columellae, have been found at Nagda (III) (Banerjee 1986:218).

Ivory: An unfinished fragment of a figure in which only one face has been carved has been found at Nagda (III) (Banerjee 1986: 244).

Semi-Precious Stone: Local manufacture of ear ornaments at Nagda is suggested by the occurrence of a few unfinished discs of agate with absolutely round profile and unfinished edges (Banerjee 1986: 223).

The Raw Materials Found Within the Sub-Region

The presence of copper, gold, steatite, ivory, quartz, trap, jade, chalcedony, agate, jasper, and carnelian has already been reported (pp. 167–69).

Iron

Significant ferruginous mineralization has been noted in the region. The important occurrences are as follows:

Raisen district: Ferruginous laterite is found at Jhamar, where large heaps of slag have also been found (Shrivastav 1979: 16);

Mandla district: Ball (1881:383) noted native working at the foot of the Amarkantak plateau, near the sources of the Seoni and Bormeyer rivers, in Mowai and near Ramgarh;

Chart 51 b

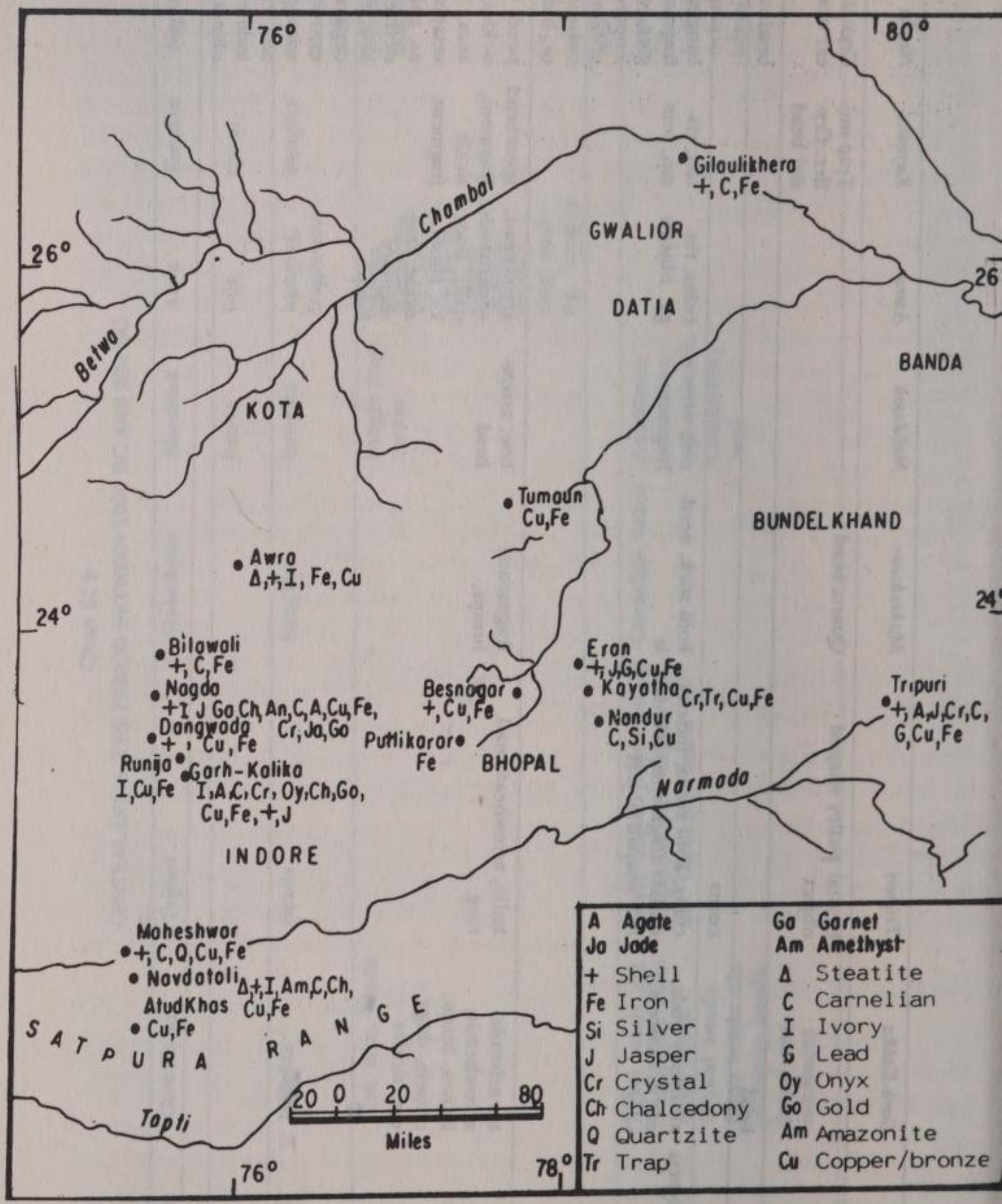
CENTRAL INDIA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Bilawali*	*Garh-Kalika*	*Tripuri*	*Maheshwar*	*Navdatoli*	*Awra*	*Kayatha*	*Nagda*
Steatite/ Soapstone					beads	lids	spool	
Shell	bangles	bangles	beads	bangles	bangles	bangles, fragments	bangles	beads, bangles, fragments
Ivory		seal, dice, beads			bangle fragments	bangle fragment, mother goddess, dagger shaped objects, ring, seali ng, bangles		comb, beads, fragment
Jade								bead
Semi-Precious Stone	Agate beads, ear ornaments. Carnelian beads. Crystal beads. Onyx beads. Chalcedony beads. Jasper ear ornament	Agate beads. Jasper pulley shaped object. Crystal beads. Carnelian beads		Carnelian beads	Amazonite beads. Carnelian beads. Chalcedony bead			Jasper, Garnet, Chalcedony, Amethyst, Carnelian, Agate beads. Jasper ear ornaments

Chart 51 b contd.)

Raw Material	*Bilawali*	*Garh-Kalika*	*Tripuri*	*Maheshwar*	*Navdatoli*	*Awra*	*Kayatha*	*Nagda*
Ordinary Stone			Crystal pulley shaped object	Quartz bead			Trap muller. Crystal bead	Crystal beads, ear ornaments
Gold		bead						bead
Lead			coins					
Copper/ Bronze	coins, objects	antimony rods, ear ornaments, wire	coins, kohl sticks, indeterminate fragments, thimble, fish shaped object	kohl stick, needle	rod, wire fragments	coins, rings, objects	rod, clamp, coin	bangle, rods, fragment, bangles, cones, leopard, nose ornament, arrowhead, mirror, hairpin
Iron	objects	spearheads, arrowheads, knives, blade, chisels, daggers, sickles	knife, arrowhead, nail, ring	fragments, lumps,	hoe, arrowhead	arrowhead, spearheads, nails, hooks, chisel, sickle, fragmentary lamp	spearhead fragment, sickle fragment	bead, bangles, sickles, hoes, axes, wedges, vessels, spoons, nails, door devices, sockets, fasteners, daggers, knives, arrowheads, spearheads, chisel, indeterminate object

Map 40



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN CENTRAL INDIA

Sagar district: Iron ore is found here abundantly in the form of ferruginous laterite, of which the most prominent outcrop is found at the summit of Tinsmal, 25 miles from Sagar along the Shahgarh road (Krishnan 1967:12). At Hirapur, iron ore occurrences were also worked (Grant 1874:436).

Jabalpur district: *The Gazetteer of the Central Provinces of India* (Grant 1894:221) noted the presence of iron in more than a hundred places, of which the principal were Simra, Gogri, Bolia, Agaria, Dalrora, Jauli, Panagar, and Lameta. Additionally, some of the localities where a native industry is reported to have flourished are Jauli, where schistose haematites were smelted, and Ghugra, east of Sihora, where manganiferous iron ore was refined (Shrivastav 1968:20).

Nimar district: Haematite was discovered in the north-east of the district, with an important deposit at Chandgarh where the ore was found to be on the surface (Russell 1908:147–8).

Bhopal district: At the Putli Karar rock shelters, the iron ores, consisting of haematitic and limonite granules were found to be locally available ores (Jacobsen 1975:89).

Lead

Lead occurrences have been reported near Sleemanabad, Jabalpur district, where indications of the mineral have been found at Ismalia, Pondi, Sunehra, Amagwan and Nawalia (Shrivastav 1968: 17).

Silver

Silver is apparently found both in the copper and lead ores of Sleemanabad (Shrivastav 1968:23). From Ismalia, 100 to 200 ounces of silver per tonne of ore were detected while in another locality 1.2 kms south south-east of Sleemanabad 19 ounces of silver per tonne were recorded (Shrivastav 1968:23).

Semi-Precious Stone

Large parts of central India are covered with Deccan trap formations in which geodes containing semi-precious stones are extremely common—these occurrences have already been noted (p. 169). Such stones are also often found in the rivers of the region. The bed of the Narmada river, for instance, in many places is known to contain onyx and amethyst, among other varieties of chalcedony (Shrivastav 1968:23).

The Raw Materials Available Outside the Sub-Region

GUJARAT

The presence of shell and amazonite has already been noted (pp. 79, 106).

CENTRAL ASIA/CHINA

The jade occurrences have been previously mentioned (pp. 78–79).

Ceramic and Other Artefactual Links

The links between the Gangetic valley and central India are clearly suggested by the P.G.W. and N.B.P. occurrences at various sites in the sub-region. P.G.W. has been found at five sites in the sub-region: Gilaulikhera (*I.A.R.* 1983–4:52), Guletha (*I.A.R.* 1981–2:32), Kotwal and Nibi (*I.A.R.* 1980–1:34–5) in the Morena district, and at Garh Kalika mound on the outskirts of Ujjain (*I.A.R.* 1956–7:24). N.B.P. ware in limited quantities has been found at the following sites: Gilaulikhera and Nibi in Morena district (*I.A.R.* 1983–4:52; 1980–1:35), Sandipani and Garh Kalika mound in Ujjain town, Dangwada and Kayatha in Ujjain district (*I.A.R.* 1982–3:59; 1968–9:67; 1956–7:24; Ansari and Dhavalikar 1975:92, 99), Nandur in Raisen district (*I.A.R.* 1981–2:36–7), Besnagar in Vidisha district (*I.A.R.* 1976–7:34), Tumaun in Guna district (*I.A.R.* 1972–3:16; 1971–2:27–8), Nadner in Sehore district (*I.A.R.* 1970–1:66), Eran in Sagar district (*I.A.R.* 1961–2:25), Awra in Mandasor district (*I.A.R.* 1959–60:24), Tripuri, Kakrahta, and Tewar in Jabalpur district (Dikshit 1955:22; *I.A.R.* 1965–6:80; 1957–8:68), Maheshwar and Burhanpur in Nimar district (*I.A.R.* 1960–1:60; Sankalia et al. 1958:133). N.B.P. Sites are also known to occur in the Rewa, Jhar, Rajgarh and Bhind districts (*I.A.R.* 1984–5:48; 1982–3:40; 1958–9:26). The number of sherds, however, is mostly very limited. For instance, at Kayatha, only two sherds have been found while, at Awra, about half a dozen pieces were recorded. Even at Maheshwar only twenty N.B.P. fragments, of which only thirteen come from a stratified deposit, were noted.

Discussion

The importance of central India in the first phase of the early historic and especially during the Mauryan period is clear from the presence of N.B.P. pottery there which, keeping in mind the quantity available, reached the region through trade. In fact, the region seemed to have opened up in different directions with settlements flourishing in pockets such as Bagelkhand and Surguja which were largely untouched in the preceding neolithic-chalcolithic horizons.

Gujarat

Gujarat is closely associated with Krishna mythology—Dwarka, on the Gomati creek, undoubtedly was closely connected with Mathura from where Krishna came, while the name of Okhamandala, the region where Dwarka is situated, is supposedly derived from Usa, the beloved of Aniruddha, Krishna's grandson. In Gujarat, early historic sites are encountered in the Surat, Junagadh, Kheda, Baroda and Broach districts. Among the important centres one may note Somnath, or Prabhas Patan as it is also known (Nanavati et al. 1971), Jokha (Mehta et al. 1971), Timbarva (Mehta 1955), Nagara (Mehta 1968), Dhatva (Mehta and Chowdhary 1975), Nagal (*I.A.R.* 1961–2:11), Dwarka (Ansari and Mate 1966) and Kamrej (*I.A.R.* 1958–9:71).

The Sitewise Distribution of Raw Materials

Chart 52 outlines the raw materials used. Briefly, these are copper, iron, silver, lead, gold, shell, ivory, steatite, sandstone, limestone, quartz, crystal, granite, trap, agate, carnelian, jasper and garnet.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: At Dhatva, the whole area around the site was found strewn with considerable quantity of slag and haematite stones (Mehta and Chowdhary 1975:18). Iron slag has also been found at Nagara (*I.A.R.* 1964–5:11).

The Raw Materials Found Within the Sub-Region

The presence of gold, copper, agate, jasper, carnelian, crystal, quartz, limestone, sandstone, granite, trap, steatite, ivory and shell has already been noted (pp. 79–81, 106–8).

Iron

Iron-ore has ben noted in the following districts:

Broach district: Ironstone of lateritic origin is distributed over a fairly large area in the Valia mahal (Palande 1961:13).

Surat district: Ball (1881:399) noted iron ores in the Balsar and Pardi subdivisions and accumulation of magnetic sand at the mouths of the rivers, especially on the Dumas side of the Tapti. Additionally, Hegde and Mehta (Hegde 1975:49–50), while exploring for lateritic formations near Dhatva, noted two such occurrences within two kilometres of the site, both of which contained limonite chunks, like those found in the remnants of ore at Dhatva.

Chart 52

GUJARAT–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Timbarva*	*Somnath*	*Jokha*	*Nagara*	*Nagal*	*Kamrej*	*Dhatva*	*Dwarka*
Shell		bangles		bangles, bead			bangles,	bangles
Steatite				bead				
Ivory		hairpins, plaques			combs, bangles, discs			
Semi-Precious Stone		Carnelian bead. Agate bead. Jasper earstud	Crystal earstud	Agate bead. Carnelian beads. Crystal beads. Jasper bead. Garnet beads	Agate bead. Carnelian beads		Carnelian beads. Agate beads	
Ordinary Stone	Sandstone pestles, quern	Limestone ball		Sandstone quern, muller fragments. Quartz bead			Granite hammerstone. Trap ball	
Silver				coin				
Gold		plating						
Lead				ear studs				
Copper Bronze	ring		nail fragment, celt, bangle fragment	bowls, coins	antimony rods	coins	coins	disc
Iron	arrowhead fragment, ploghshare, blade fragments		objects	slag, arrowheads, spearheads, nails	objects		slag, hoes, blades, pipes, nails	piece

Lead

Lead occurrences have been noted at Banejnes in the Gir forest of Junagadh district and at Khandia village in Baroda district (Shekhar and Mukul 1972; Chatterji 1972:149; Vemban and Yellur 1972).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region. One silver coin, found at Nagara, may have come as a finished item to Gujarat, probably from Rajasthan since silver is not locally available.

Ceramic and Other Artefactual Links

Ceramic affinities with the Gangetic plains are manifest in the N.B.P. fragments found at three sites in the region: at Timbarva (Baroda district) six sherds were recovered (Mehta 1955:37); at Jokha (Surat district) a small sherd was found on the surface (Mehta and Chowdhary 1971:29) and at Nagara (Kheda district) some nondescript fragments were found (Mehta 1968:85).

Discussion

The literary image of Gujarat as containing important trade emporia, together with its geographical situation on the eastern coast, from where sea traffic with other countries was articulated, is not effectively reflected in the archaeological record. No significant urban remains have been noted and even the range of raw materials used is more or less limited to those found within the sub-region itself. The basic evidence that suggests the presence of interregional links going up to the Gangetic plains is in the form of limited N.B.P. fragments. This is authenticated by the edict of Asoka at Junagarh and the reference to a viceroy of Chandragupta Maurya in the Junagarh inscription of Rudradaman (150 AD).

Maharashtra

Maharashtra can be visualized within different cultural zones. To begin with, there is the widespread phenomenon of iron bearing megalithic burial and habitation sites concentrated in the Vidarbha region, with megaliths in the Nagpur, Wardha, Yeotmal, Chanda, Kolhapur, Ratnagiri, Khandesh and Poona districts (*I.A.R.* 1984–5:52; 1981–2:51; 1978–9:71; 1966–7:25). Among the significant excavated megalithic sites, Takalghat, Khapa, Mahurjhari (Deo 1973) Gangapur and Naikund are noteworthy (Deo 1970; Deo and Jamkhedkar 1982; Rajaguru 1982). Secondly, there were a number of early historic sites in the sub-region with the merging of the

megalithic culture into that phase—the significant excavated sites in this context are Bhokradan (Deo 1974), Pauni (Deo and Joshi 1972), Ter (Chapekar 1969), Songaon (Deo and Mujumdar 1969), Nevasa (Sankalia et al. 1966), Paunar (Deo and Dhavalikar 1968) and Kaundinyapura (Dikshit 1968). Many such urban and early historic centres were the domiciles of lay Buddhist donors. Finally, there are a number of rock-cut caves all along the route, from Mahismati to Sopara in the Thana district of Bombay—although some of them were excavated in the pre-Satavahana period, it was really during the time of the Satavahana dynasty, from the second century BC onwards that such establishments in this region began to flourish. The occurrence of N.B.P. pottery at some centres and an Asokan edict at Deotek, southwards of Pauni also suggest Mauryan political influence over the region.

The Sitewise Distribution of Raw Materials

Charts 53a–b exemplify the range of raw materials used. These are silver, lead, gold, copper, iron, steatite, shell, coral, ivory, agate. carnelian, chalcedony, jasper, garnet, bloodstone, crystal, amethyst, lapis, lazuli, basalt, trap, sandstone, diorite, schist, and obisidian.

The Evidence of Manufacture of Finished Products at Different Sites

Coins: A terracotta coin mould, with two full sockets and part of a third socket, was found at Bhokradan (Mound 1, trench A5, layer 5) (Deo 1974:73).

Beads: Evidence for local bead manufacture comes from Bhokradan, Mahurjhari and Kaundinyapura. At Bhokradan, a garnet nodule, irregularly perforated, has been found (Deo 1974: 127). Mahurjhari, even before it was excavated, was known for the thousands of unfinished beads of carnelian and agate that used to be collected from it by the local people (Deo 1973:33). According to Deo, these beads can all be assigned to an early historic period. Furthermore, many unperforated carnelian beads were also found in the megalithic field. In the excavations one unperforated agate bead was also noted at Mahurjhari. From Kaundinyapura, two unfinished agate beads, and one unfinished carnelian bead were noted (Dikshit 1968:91–2).

Iron: Striking evidence of iron smelting comes from Naikund where the remains of a smelting workshop were unearthed at a depth of 1.25 metres, with the help of a resistivity recording meter (Deo and Jamkhedkar 1982:11): 'The bottom of the furnace was also paved with bricks and was found to have been fused with slag and cinder. . .Two tuyeres, made of clay, but in vitrified condition,

Chart 53 a

MAHARASHTRA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Junapani*	*Ter*	*Pitalkhora*	*Kaundinyapur*	*Naikund*	*Nevasa*	*Mahurjhari*	*Paunar*	*Pauni*
Shell		beads, bangles, rings		beads, bangle fragments		beads, bangles, rings			
Coral						bead		bead	
Steatite/ Soapstone				beads		beads			
Ivory						seals, combs handles			
Lapis Lazuli				bead		beads			
Ordinary Stone	Sandstone pestle	Basalt mullers, quern. Sandstone sharpener	Crystal stupas, beads	Crystal beads, ear plugs, reliquary fragments, pendant. Trap querns, mullers. Sandstone pivots. Obsidian earreel	Tremolite Schistose axe	Trap hammerstone, anvils, mullers. Basalt quern. Epidiorite mullers. Crystal beads	Basalt pounders. Sandstone pounders. Crystal beads		
Semi-Precious Stone	Carnelian beads	Carnelian bead		Carnelian beads. Agate beads. Chalcedony bangle, Jasper earplug, beads. Amethyst bead		Jasper beads, dabber. Agate beads. Amethyst beads. Bloodstone beads. Chalcedony bead	Carnelian beads. Jasper beads. Agate beads. Chalcedony beads	Jasper ear ornament	Agate beads. Jasper beads

(Chart 53 a contd.)

Raw Material	*Junapani*	*Ter*	*Pitalkhora*	*Kaundinyapur*	*Naikund*	*Nevasa*	*Mahurjhari*	*Paunar*	*Pauni*
Gold	necklace, bangle, ring			beads	wire, leaf pieces	bead	necklaces, beads, earrings, leaf, discs, fragments		
Silver						coin			coin
Lead						nail			
Copper/ Bronze	anklets, bell, bangle wire	coins, borer, kohl sticks, pin fragment		bell, coins, antimony rods, wires, bangles	bowls, pots, dishes, lids, bells, strip, ornamental pieces, horse ornaments	coins, kohl sticks, bead, pendants, rings, hooks, rods, wires	dishes, bowls, lids, bangles, horse ornaments, fragmentary wires, bells	bangle, antimony rod	coin, ring, bangles
Iron	objects, axes, dagger, spear, lance, chisel shaped implement, ladle	nails, lumps, nail fragments, arrowheads, spearheads, knife blades		arrowheads, chisel fragment, crowbar fragment, tongs, indeterminate object, sword blade, javelin fragments	axes, hoes, chisels, knife, tongs, nail parers, hooks, dishes, ladles, blades, adzes, clamps	arrowheads, chisel, blades, tongs, sickles, spearhead, drill, pot, ladles, bowl, clamps, nails, bangles, rings, handle, indeterminate object	axes, chisel, indeterminate objects, ploughshares, daggers, knives, arrowheads, sulas, ladles, nail, nail parers, adzes, horse equipment	blade fragments, chisel, sickles, rings, indeterminate object	nails, sickle, fragment

Chart 53 b

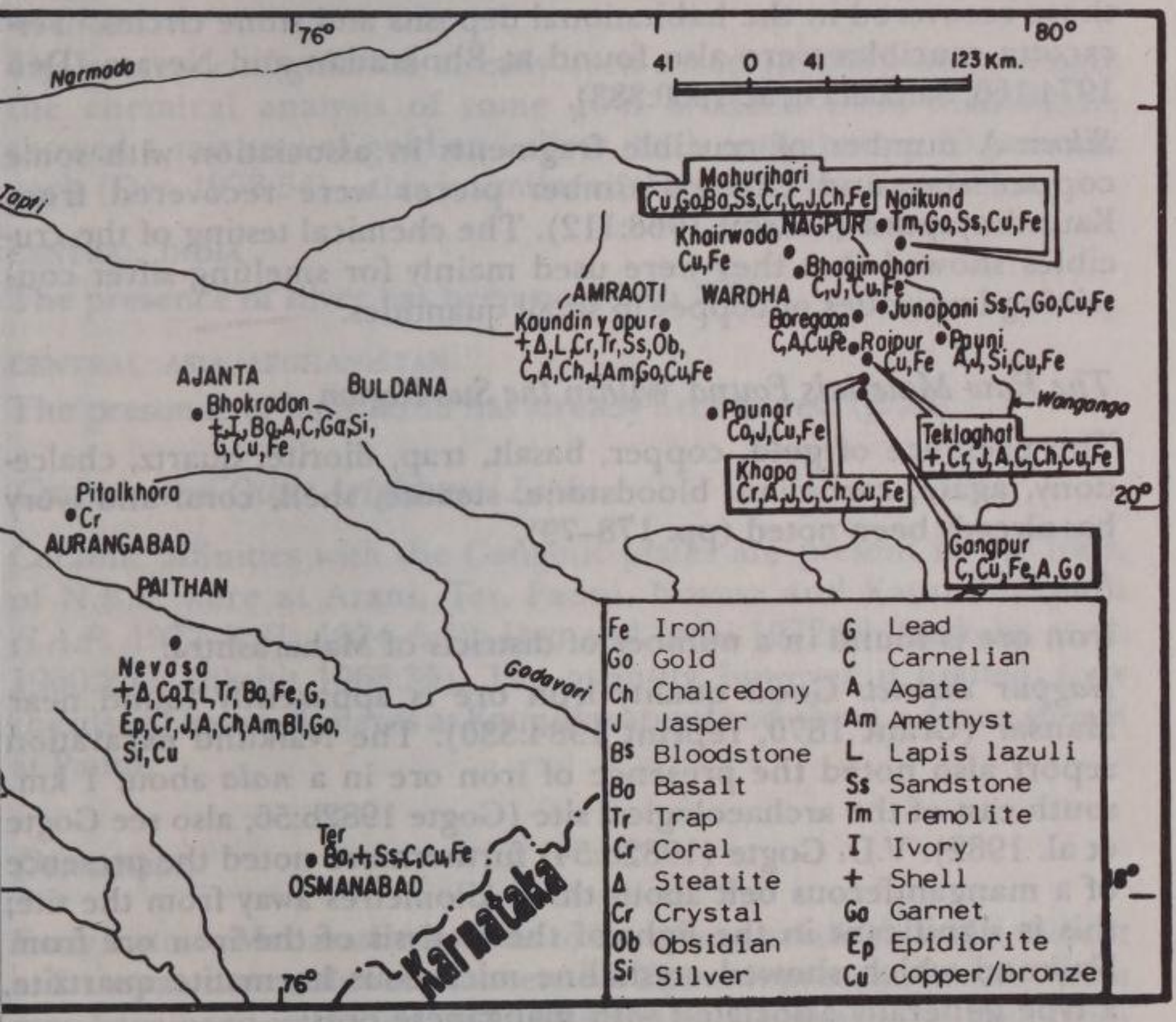
MAHARASHTRA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Raipur*	*Khapa*	*Bhagimohari*	*Teklaghat*	*Khairwada*	*Gangpur*	*Boregaon*	*Bhokradon*
Shell				beads				bangles, stopper, beads
Ivory								kohl sticks
Ordinary Stone		Crystal beads		Crystal beads				Basalt dabber
Semi-Precious Stone		Agate beads. Jasper beads. Carnelian beads. Chalcedony beads	Carnelian beads. Jasper beads	Jasper beads. Agate beads. Carnelian beads. Chalcedony beads		Carnelian beads	Carnelian beads. Agate beads	Agate bead. Carnelian tablet, bead, ring. Garnet beads
Silver								plating
Gold							earrings	
Lead								object
Copper/ Bronze	bangles, lids, objects	bangles, bell, dishes, bell shape objects, lids, horse face ornament, indeterminate object	bangles	bangles	bangles, objects	bangles	dish, lid, bangles	coin, antimony rod, indeterminate object, ear ornament

(Chart 53 b contd.)

Raw Material	*Raipur*	*Khapa*	*Bhagimohari*	*Teklaghat*	*Khairwada*	*Gangpur*	*Boregaon*	*Bhokradan*
Iron	nail parers, lamps, adzes, hoes, arrowheads, fasteners	ladles, nails, dagger blades, sword, arrowheads, knife, chisels, spike, adzes, axes, tang pieces, bar, fish hook, horse bit, nail parers, indeterminate objects, caldron	axes, fasteners, hoes, arrowheads, rings, nail parers, adzes, chisels, spearheads, ladles, spikes	ladles, nails, dagger blades, arrowheads, knife, axe, adzes, blade, tang pieces, bar, fish hook, indeterminate object	axes, nails, knife blades	ladles, nails, spearhead, arrowhead, chisels, spike, axes, adzes, blade, tang pieces, nail parers	tridents, adzes, sickles, arrowheads, axes, nail parers, chisels clamps	nail parer, nails, fragments, chisels, sickle, arrowheads,

Map 41



THE PERIOD BETWEEN 1000 B.C AND 200 B.C. –SITEWISE DISTRIBUTION OF RAW MATERIALS IN MAHARASHTRA

were also recovered. . .Besides these, about 40 kgs of iron slag was found along with sherds of the Micaceous Red Ware similar to those recovered in the habitational deposits and stone circles.' Terracotta crucibles were also found at Bhokradan and Nevasa (Deo 1974:166; Sankalia et al. 1960:383).

Silver: A number of crucible fragments in association with some copper slag and charred timber pieces were recovered from Kaundinyapura (Dikshit 1968:112). The chemical testing of the crucibles showed that they were used mainly for smelting silver containing impurities of copper in small quantities.

The Raw Materials Found Within the Sub-Region

The presence of gold, copper, basalt, trap, diorite, quartz, chalcedony, agate, carnelian, bloodstone, steatite, shell, coral and ivory has already been noted (pp. 178–79).

Iron

Iron ore is found in a number of districts of Maharashtra:

Nagpur district: Good quality iron ore is apparently found near Mansar (Grant 1870, reprint 1984:330). The Naikund excavation report also noted the presence of iron ore in a *nala* about 1 km. south-east of the archaeological site (Gogte 1982b:56; also see Gogte et al. 1982). V.D. Gogte (1982b:54) furthermore noted the presence of a manganiferous belt about three kilometres away from the site; this is significant in the light of the analysis of the iron ore from Naikund which showed crystalline micaceous haematite quartzite, a type generally associated with manganese ores;

Chandrapur district: C. Grant (1870:135) noted the richness of iron ores in the extreme north and south of the district which 'varies in appearance from a bright steely substance to a dull red brown rock, and from a ferruginous earth to a black sand';

Bhandara district: Ore bodies are found at Khursipur, Sohi, Dhobitola and Ambetalao (Roy Chowdhury 1974:24);

Ratnagiri district: Iron ore is found in extensive lateritic horizons near Redi port (Roy Chowdhury 1974:25). Ore occurrences have also been reported from Banda and Tiravada (Roy Chowdhury 1974:25);

Amraoti district: The Amraoti district gazetteer (Fitzgerald and Nelson 1911, reprint 1985:9–10) noted two tracts of lateritic ore, one south of Ritbpur and the other about four miles north of Amraoti.

Lead

The presence of galena has been noted by Grant (1870:330), although the regions are not specified

The Raw Materials Available Outside the Sub-Region

KARNATAKA

The presence of gold has already been noted (p. 205). Interestingly, the chemical analysis of some gold artefacts from Mahurjhari showed a mixture of gold and silver, both contributing 50 per cent each (Deo 1973:54)—this is similar to the gold from Karnataka.

CENTRAL INDIA

The presence of silver has been noted (p. 329).

CENTRAL ASIA/AFGHANISTAN

The presence of lapis lazuli has already been noted (p. 28).

Ceramic and Other Artefactual Links

Ceramic affinities with the Gangetic plains are present in the form of N.B.P. were at Arani, Ter, Pauni, Nevasa and Kaundinyapura (*I.A.R.* 1977–8:81; 1974–5:32; Deo and Joshi 1972:58; Sankalia et al. 1960:259; Dikshit 1968:35). The quantity, however, is limited: four sherds at Nevasa, 3 sherds at Kaundinyapura and about a dozen sherds at Pauni.

Discussion

Early historic Maharashtra seems to have been relatively self-sufficient as far as raw materials were concerned. The only precious metals which may have been imported from outside the sub-region are gold from Karnataka and silver from central India, and as the evidence from Kaundinyapura suggests, they were locally smelted and probably worked. The two lapis lazuli beads at Nevasa were undoubtedly elements in a long-distance trade with Central Asia. The Mauryan silver coin at Pauni and a silver punch marked coin at Nevasa were probably imports from the Gangetic plains.

North Karnataka and the Malnad Region

The cultural horizon of the region in the post neolithic-chalcolithic phase was dominated by the presence of megaliths over almost the whole of the region. Known as Pandukal (old stone) and as *Kuranguppattadai* (workshops of the monkey), they are distributed all over south India, reaching northwards into the peninsular divide. The problems and issues connected with their authorship, distribution, chronology, etc. have been extensively discussed (Srinivasan 1946; Srinivasan and Banerjee 1953; Krishnaswami 1949; Narasimhaiah 1980; Ramachandran 1980; Sundara 1973, 1979). Although their wide distribution, and the various sub-types within

the complex suggest a number of differences among the various groups, there are also a number of conformities which have resulted in them being treated as a single complex. We have chosen to do precisely that, basing our discussion on Leshnik's (1974:154) treatment of the different types as representing the range of variations within the same complex. Among the excavated megalithic/iron-bearing levels in the sub-region, one may note Brahmagiri (Wheeler 1947–8), Piklihal (Allchin 1960), Maski (Thapar 1957) and Hallur (Nagaraja Rao 1971). The beginning of the early historic period is, however, shadowy. The major evidence is really in the form of the Asokan edicts. Maski, incidentally has been sought to be identified with Suvarnagiri, the headquarters from where the Minor Rock Edicts of Asoka were issued. However, although an Asokan edict is also addressed to the Mahamatras of Isila, the name of ancient Brahmagiri, the cultural association could only have been with the megalithic people, since a well-defined early historic level emerges only in the beginning of the first century AD. Recently Vimala Begley (1986:297), on the basis of the re-evaluation of the Arikamedu data, has argued for a date of second century BC for the beginning of the early historic period there. However, one will have to wait for more definitive evidence to settle the issue. The only noteworthy exception seems to be the Belgaum district where at Vadgaon-Madhavapur, a fifth century BC occupation along with an early Satavahana level has been noted (*I.A.R.* 1971–2:38–9).

The Sitewise Distribution of Raw Materials

Charts 54a–b outline the raw materials used. These include iron, copper, gold, steatite, shell, coral, lapis lazuli, agate, chalcedony, garnet, serpentine, jasper, dolerite, epidiorite, quartzite, carnelian and granite.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Various smelting areas were found around Piklihal which, according to Allchin (1960:137), may possibly go back to the period when iron artefacts were first manufactured at the site.

The Raw Materials Found Within the Sub-Region

The presence of copper, gold, granite, steatite, carnelian and jasper has already been noted (p. 201, 204–6).

Chart 54 a

NORTH KARNATAKA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Komaranahalli*	*Tadakanahalli*	*Hunnur*	*Halingali*	*Hallur*	*Brahmagiri*
Steatite						beads
Shell						bangle
Ordinary Stone					Dolerite chisels, axes, axe-hammers. Epidiorite wedge. Granite wedge, hammer. Quartzite rubber	Granite ball, pestle
Semi-Precious Stone						Serpentine bead. Jasper bead
Gold						beads
Copper/ Bronze			bell		rod	bangle
Iron	arrowheads, axe, knives, rods	arrowheads, daggers, axe, spearheads, knives, nail	object	objects	arrowheads, knives, knife blades, spearheads, points	sickles, knives, swords, spears, arrow-heads, wedges, bars, fragment, chisels, dish-like object, lances, stopper-like object, rings, nails

Chart 54 b

NORTH KARNATAKA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Someshvara Hill*	*Gajendragad Hill*	*Piklihal*	*Rajankolur*	*Jewargi*	*Talkur*	*Maski*
Shell						pieces	beads, bangles
Coral							beads
Steatite			beads				
Lapis Lazuli							beads
Ordinary Stone							Dolerite axes. Granite ball, pestles. Quartz bead
Semi-Precious Stone			Carnelian beads		Carnelian beads		Carnelian beads. Chalcedony bead. Jasper bead. Garnet beads. Agate beads
Gold							bead
Copper/ Bronze			bell				
Iron	dagger, knife	objects	fragment, strips	objects	spearheads, swords, knives, tripods, sickles, hook, arrowheads, indeterminate objects	pieces, fragment	lumps, blade, lance, chisel, bangie, ferrule, sickle blade, axe, dagger blade, lance blade, arrowhead, nail

Map 42

THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN KARNATAKA

Iron

A number of iron ore deposits of the sub-region have been outlined in *Geological Survey of India Miscellaneous Publication No. 30* (Karunakaran 1974a:19–20). Some details are also available in the district gazetteers (Abhishankar 1970; *Gazetteer of the Bombay Presidency* Vol. XXIII 1884: 50).

Bellary district: Major haematite ore-bodies are found in Bellary, especially in the Bellary-Sandur area;

North Kanara district: Iron ore is found at Apsarkond, Badgar, Hoshalli, Kalche-chiloni in Bisgod, Hudsa, Siddi, Ivoli and Anmod;

Shimoga district: Several small haematite deposits and manganese deposits have been noted;

Chitradurga-Tumkur district: Several deposits of iron-ore have been located here;

Raichur district: Iron ores occur near Rajavoli as lateritic segregations and near Jadagudda hill;

Bijapur district: Iron ore in this district was found and/or smelted at the end of the nineteenth century, among other places at Adgal, Siddapur, Jainmatti, Sidanhal, Haligeri and Raghapur.

Serpentine

B.L. Rice's (1897: 26) gazetteer of the old Mysore province noted serpentine near Tururekere.

The Raw Materials Available Outside the Sub-Region

Coast

The presence of shell has already been noted (p. 79).

Ceramic and Other Artefactual Links

No artefacts or cultural traits which can be stated to be of specifically non-local origin have been found in the sub-region.

Discussion

The megalithic culture/s of Karnataka seem to have been part of a cultural movement that dominated all the regions from Vidarbha southwards, from the end of the neolithic tradition till the beginning of the first century AD This phenomenon, like the preceding neolithic-chalcolithic horizon, does not display any significant archaeological links with the regions to its north. The literary and epigraphic tradition, however, seems to suggest significant contacts, whether we look at the *Arthasastra* of Kautilya which is

known to have noted gemstones and precious metals emanating from south India, or the presence of Asokan edicts there.

South Karnataka

Like the north *Maidan* region, South Karnataka saw a number of megalithic settlements and burial sites, primarily in the Mysore and Kolar districts (Krishnamurthy 1978:80–9). Megalithic sites have also been reported from the Chikmagalur and Mysore districts and the Coorg region (*I.A.R.* 1981–2:92; 1980–1:31; Subbaya 1978). Excavations have taken place at Banahalli (*I.A.R.* 1983–4:44–5) and T. Narasipur (Seshadri 1971).

The Sitewise Distribution of Raw Materials

Chart 55 exemplifies the raw materials used. These include shell, potstone, iron, gold, copper, agate, carnelian, quartz and granite.

The Evidence of Manufacture of Finished Products at Different Sites

No published evidence on local manufacturing activities at the sites is available.

The Raw Materials Found within the Sub-Region

The presence of copper, gold, granite, and chalcedony has already been noted (pp. 205, 209–10).

Iron

Magnetite deposits are found in the Mysore district (*Geological Survey of India Miscellaneous Publication No. 30* Karunakaran 1974a: 19–20). In the Chikmagalur district important iron ore deposits are found at Attigundi, Galikhere, Gundikhan, Rudragiri and Jensarigudda. In the Kolar district, laterite is found in disconnected patches on flat-topped hills around Sidlaghatta, Srinivaspur, Jangamkote and Malur (Abhishankar 1968:16).

Potstone

The occurrence of steatite and potstone in the old Mysore province has been noted by Rice (1897:16) and Ball (1881:440).

The Raw Materials Available Outside the Sub-Region

No raw materials seem to have been procured from outside the sub-region.

Chart 55

SOUTH KARNATAKA–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Banahalli*	*Kendatti*	*Jadigera*	*T. Narasipur*	*Moribetta*	*Savandurga*	*Ittegebail*	*Anegutahalli*
Shell	bangles, beads							
Ordinary Stone	Quartz beads			Granite grinding implements, querns, anvil. Potstone grinding implements, ringstones. Quartz rubber				
Semi-Precious Stone					Carnelian beads. Agate beads			
Gold					plate			
Copper/ Bronze	spoons, bangle fragments, bead				disc		foil	
Iron	nails, spear-heads, arrow-heads, knife	slag	sickles, dagger	wire fragment, nail, knife blade fragments		arrowheads	arrow, javelin heads, chisel-like objects, dagger blades, pots, arrowheads, nail, points, knife blades	pan

Ceramic and Other Artefactual Links

No artefacts of non-local provenance or inspiration were noted in the archaeological repertoires of the sites of the sub-region.

Discussion

Like north Karnataka, the southern section of the plateau does not display significant archaeological links towards the north of the subcontinent.

South Western Coastal Region

This strip of land bound by the Western ghats on the east and the Arabian sea on the west, was geographically located at the point where a number of maritime routes converged, which, along with the fact that the word Keralaputra appears in one of Asoka's edicts (the earliest reference to the Chera state) would suggest that in the early historic period, a number of large commercial settlements showing clear interregional links were flourishing there. The archaeological evidence, however, belies any such expectations and, in the period under discussion, the only relevant cultural stratum is in the form of megalithic monuments, which also, incidentally, constitute the first definable protohistoric stratum there (Sarkar 1973:13). It is also important to note that the dates of the Kerala and Coorg megaliths are much later than those in Karnataka. Sarkar (1973), in his classification of these monuments, noted their wide chronological distribution, from two or three centuries before and one century after Christ, some being probably even later. This conforms with Thapar's (1952:6) chronological ordering of the excavated evidence from the megalithic urn burial at Porkalam, Trichur district.

The Sitewise Distribution of Raw Materials

Chart 56 outlines the raw materials used. These include iron, carnelian, agate, felspar and crystal.

The Evidence of Manufacture of Finished Products at Different Sites

No evidence of local manufacture in Kerala is available in the relevant published archaeological literature.

Chart 56

SOUTH WESTERN COAST–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Machad*	*Punkunnam*	*Chengamenad*	*Porkalam*	*Chataperamba*	*Kaltakampal*	*Virajpeti*
Ordinary Stone	Felspar beads. Crystal beads						
Semi-Precious Stone	Carnelian beads. Agate beads			Carnelian beads	Carnelian beads		
Iron	chisels, nails, daggers, hooks	implements	axes, swords	dagger, indeterminate objects	tripod stand, spear, javelin head, disk lamp, spears, spearheads, hook, daggers, swords, hoe	swords, hatchets, forks, stands, spear	spears, javelins, arrows, daggers

The Raw Materials Found within the Sub-Region

Iron

The relevant Geological Survey of India publication (*Miscellaneous Publication No. 30*–Varadan 1976b: 17–20) mentions a number of occurrences. The Cannanore and Coorg Gazetteers give the relevant occurrences there (Sreedhara Menon 1972:16; Sri Sathyan 1965:20):

Calicut Kozhikode district: Iron ore occurs at Cheruppa, Eleyettimala, Naminda, Nanduvallur, East and West Hill band, and the Alampara area;

Kottayam district: Iron ore bands occur west of Kaliyar Estate, northwest of Iddiki, Kotpara, Kalliparamudi, Rendar and Eranalu;

Malappuram district: Iron ore is found in the Korattimala area and the Manjeri area;

Palghat district: Iron-bearing quartzite has been found in the Attapady valley, Kilur, Mannambatti, Karivallur, Valur, Nadupati, and west of Elival;

Quilon district: Lateritic iron ore occurrences are seen in the vicinity of Mulavana and Tonipara near Nellitti;

Trichur district: Iron ore is reported north of Adatt and in the Velangans area;

Cannanore district: Ferruginous laterite is found in the Kasaragod taluk, in Patturkal hill, near Perdala and Bela;

Coorg district: Some minor iron ore occurrences are noted in the Coorg district.

Felspar

Felspar is found as an accessory mineral in the pegmatite veins that traverse many places in Trivandrum and Quilon districts (*Geological Survey of India Miscellaneous Publication No. 30*—Varadan 1976b:8–9). Felspar is also found in the Kozhikode, Trichur and Palghat districts (Sreedhara Menon 1962a:12–13; 1962b:10; Kareem 1976:14).

The Raw Materials Available Outside the Sub-Region

KARNATAKA

Carnelian, agate, and crystal occurrences have already been noted (pp. 204, 209).

Ceramic and Other Artefactual Links

No artefactual evidence on interregional interaction is available.

Discussion

In the absence of securely known neolithic-chalcolithic horizons in the sub-region, the full-fledged iron age horizon in the last centuries BC there was probably an outcome of influences emanating from Karnataka, which also probably provided the sites of the sub-region with semi-precious stones of the silecious variety which were not locally available.

Andhra Plateau and the Andhra Coastal Plains

In the Krishna-Godavari delta and its adjacent uplands, megalithic remains abound, such relics being found in the Guntur, Krishna, Mahbubnagar, Prakasam, Nalgonda, Srikakulam, Bhadrachalam, Kurnool, Cuddapah, Rangareddy, Karimnagar, Warangal, Hyderabad and Adilabad districts (*I.A.R.* 1984–5:4, 6; 1983–4:5, 9; 1982–3:3; 1978–9:92; 1976–7:3, 5; 1970–1:1–2; 1966–7:1). That the sub-region had emerged into the early historic period by the pre-Mauryan period is evident from literary and archaeological sources. In the *Dhammapadatthakattha*, there is a reference to the city of Amravati where it is stated that the Buddha in one of his previous births was born as a brahmin youth (cited in Law 1932, reprint 1973:62). Although the Buddhist site par excellence of Andhra ie., Nagarjunakonda, emerged in the early historic light only in the early centuries A.D., the beginning of the Andhra historical period definitely goes back to the 3rd–2nd centuries BC as exemplified by the presence of Asokan edicts there, sculptural reliefs at Amaravati, and stupa sites like Salihundam in the Srikakulam district, which formed part of the ancient kingdom of Kalinga. The important excavated sites of the district are Satanikota (Ghosh 1986), Veerapuram (Sastri et al. 1984), Salihundam (Subramanyam 1984), Yeleswaram (Khan 1963), Hashmatpet (Nigam 1971), Dharanikota (*I.A.R.* 1964–5:2) and Nagarjunakonda (Subrahmanyam 1975; Longhurst 1938; Ramachandran 1953; Sastri 1961).

The Sitewise Distribution of Raw Materials

Charts 57a–c outline the raw materials used. These include copper, iron, silver, gold, lead, shell, steatite, ivory, carnelian, chalcedony, jasper, agate, garnet, crystal, lapis lazuli, limestone, quartzite and sandstone.

Chart 57 a

ANDHRA PRADESH–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Hazurnagar*	*Pagidigutta*	*Uppalapadu*	*Peddamarur*	*Polakonda*	*Kadambapur*	*Vemuluru*	*Hasmatpet*	*Peddabankur*
Steatite		beads							
Shell				bangles					
Ordinary Stone				Crystal beads					
Semi-Precious Stone	Carnelian bead			Jasper beads. Carnelian beads					
Gold						earrings			
Copper/ Bronze			rings	bangles, ring	coin	hilt			bangles, antimony rods
Iron	objects		objects	arrowhead, spearhead, sickle, dish, spatula-like implement, nail, chisel, knives, blade		objects	dagger, adzes, sickles, arrow tip	sickle, object	dagger, sickles, arrowheads

Chart 57 b

ANDHRA PRADESH–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Gudimallam*	*Pochampad*	*Mallepadu*	*Kesarapalli*	*Vaddamanu*	*Satanikota*	*Ramapuram*	*Yelesvaram*	*Chinnamanur*
Steatite							beads		
Shell						bangle fragments	fragments, beads		
Ivory		comb							
Ordinary Stone						Limestone object			
Semi-Precious Stone			Jasper beads. Carnelian beads					Carnelian bead	
Silver	coin				coins				
Copper/ Bronze		hilts			coins	rattle, object	bells, celts, chisel, tongs, razor, wire, needle		
Iron		sickles, chisel, indeterminate object, dagger, lance, axes	objects			nail, conical object	objects, chisels, knives, spearheads, dagger, lance, javelin-like object, arrowheads, strap-like object, tripod, razor-like object	tongs, ploughshare, arrowhead, dagger, javelin	dagger

Chart 57 c

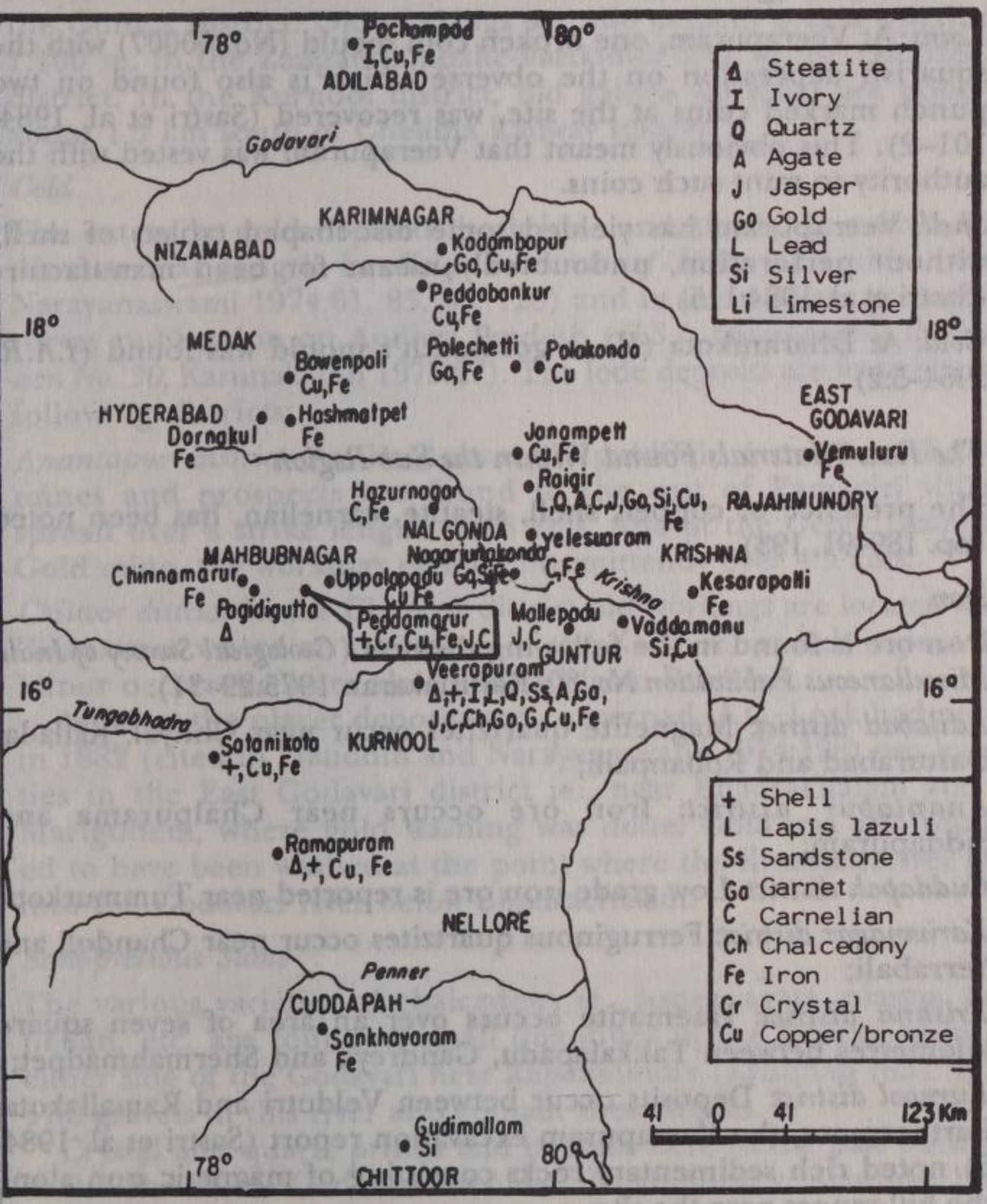
ANDHRA PRADESH–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Veerapuram*	*Raigir*	*Nagarjunakonda*	*Sankhavaram*	*Polechetti*	*Dornakul*	*Janampett*	*Borwenpalli*
Steatite	beads							
Shell	bangles, beads							
Ivory	objects, kohl stick, hairpin							
Lapis Lazuli	beads	beads						
Ordinary Stone	Quartzite ball, hammerstone, rubber stone, quern fragment, ball. Sandstone sharpener	Quartz beads						
Semi-Precious Stone	Agate beads. Garnet beads. Jasper beads. Carnelian bead. Chalcedony bead	Agate beads. Carnelian beads. Jasper beads						

(Chart 57 c contd.)

Raw Material	*Veerapuram*	*Raigir*	*Nagarjunakonda*	*Sankhavaram*	*Polechetti*	*Dornakul*	*Janampeti*	*Borwenpalli*
Gold	beads	plating	earrings, beads		ring			
Silver		rings	beads					
Lead	object							
Copper/ Bronze	antimony rods, finger rings, toe rings, bangles, awl, bead, bells, fragments, blades, wire	bell					bowl, bell, trinket	ornaments
Iron	nails, knives, rings, bowls, fasteners, hooks, chisels, arrowheads, sickles, axe, strip, hook fragment, plough fragment, spearheads	trident, fork, knife, dish	daggers, knife blades, indeterminate objects, lance, arrowheads, wedges, nail, implements, spears, lump	spearhead, knife piece	pieces, plough shares, nail, spike, spear, spear point	sickle	implements, dagger, axes, lamp, sickle	objects, trident

Map 43



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN ANDHRA PRADESH

The Evidence of Manufacture of Finished Products at Different Sites

Coins: At Veerapuram, one broken coin mould (No. 60007) with the squarish depression on the obverse which is also found on two punch marked coins at the site, was recovered (Sastri et al. 1984: 101–2). This obviously meant that Veerapuram was vested with the authority to mint such coins.

Shell: Veerapuram has yielded some disc-shaped tablets of shell, without perforation, undoubtedly meant for bead manufacture (Sastri et al. 1984:115).

Gold: At Dharanikota (II), a goldsmith's mould was found (*I.A.R.* 1964–5:2).

The Raw Materials Found Within the Sub-Region

The presence of copper, shell, steatite, carnelian, has been noted (pp. 189–91, 193).

Iron

Iron ore is found in the following districts (*Geological Survey of India Miscellaneous Publication No.* 30–Karunakaran 1975:29–31):

Adilabad district: Magnetite quartzites occur near Chityal, Kallada, Dasturabad and Robanpalli;

Anantapur district: Iron ore occurs near Chalpurama and Siddapuram;

Cuddapah district: Low grade iron ore is reported near Tummurkota;

Karimnagar district: Ferruginous quartzites occur near Chandoli and Yerrabali;

Krishna district: Haematite occurs over an area of seven square kilometres between Takkalapadu, Gandreye and Shermahmadpet;

Kurnool district: Deposits occur between Veldutri and Ramallakota. Furthermore, the Veerapuram excavation report (Sastri et al. 1984: 6) noted rich sedimentary rocks consisting of magnetic iron along the hill ranges near the site;

Prakasam district: Magnetite-quartzites occur in the Ongole area and in the Gundalakamma group comprising the Byrepalle, Errapalem, Tummavaram and Manikesvaram deposits.

Lead

Occurrences of lead have been reported from the Chittoor, Cuddapah, Guntur, Hyderabad, Khammam, Kurnool, Nalgonda and West Godavari districts (*Geological Survey of India Miscellaneous Publication No.* 30–Karunakaran 1975:33). Inclined shafts, tailing

dumps and remains of old workings have been found in the Nallakonda, Bandalamotta and Dhukonda areas of Agnigundala in the Guntur district. Old workings are also present over a length of 1,100 m. in the Zangamrajupalle-Varikunta area in the Cuddapah district. In the Kurnool district, old galena workings are noticed about 1.5 km south of Chelima Railway station.

Gold

The extensive gold deposits, both lode and alluvial in nature, are discussed at length in *Gold Resources of India* (Ziauddin and Narayanaswami 1974:61, 85, 86, 128) and in the relevant geological survey publication on Andhra Pradesh (*G.S.I. Miscellaneous Publication No. 30,* Karunakaran 1975:27). The lode deposits are found in the following districts:

Anantapur district: At the Anantapur goldfield a number of gold mines and prospects are found to the east of Ramagiri village spread over a strike length of 15 kms. Also at the Geoty (Pamidi) Gold mine, the workings extend intermittently over 4.5 kms;

Chittoor district: In the Chittoor district old workings are located near Bisanattam where an extension of the Kolar schist belt is present. Minor occurrences are also reported from Paluchur.

As far as the placer deposits are concerned, A.G. Lock had noted in 1882 (cited in Ziauddin and Narayanaswami 1974:128) two localities in the East Godavari district ie., near Bhadrachalam and at Marigudem, where gold washing was done. Gold was also reported to have been washed at the point where the Kinersani river falls into the Godavari river below Bhadrachalam.

Semi-precious Stone

The various varieties of chalcedony ie., jasper, agate, plasma, carnelian, etc. are found in small quantities in the Deccan traps on either side of the Godavari near Rajahmundry (Krishnan 1951: 115). The gravels in this river also contain these stones.

Crystal and quartz prisms and pebbles were in the past obtained in the bed of the Godavari river near Rajahmundry (Krishnan 1951: 118. The details of other sites are also from this memoir). Crystals are also obtained, occasionally, in the mica mines of the Nellore district and from cavities in pegmatites and granites of other areas. Crystals are also common in the neighbourhood of Karnetnagar in the Chittoor district.

Garnet

Abundant crystals of garnet occur in the Khammam, Krishna and Nellore districts (Karunakaran 1975: 26–7).

The Raw Materials Available Outside the Sub-Region

KARNATAKA

The presence of silver (in gold) has been noted (p. 205).

CENTRAL ASIA/AFGHANISTAN

The presence of lapis lazuli and silver has already been noted (p. 28).

Ceramic and Other Artefactual Links

The presence of N.B.P. pottery fragments at Vaddamanu, Amravati and Chebrolu, all in the Guntur district (I.A.R. 1982–3:2; 1960–1:1) is indicative of links with the Gangetic plains.

Discussion

The Andhra region was undoubtedly one of the focal points in the border regions of the Mauryan empire, as exemplified by the presence of Asokan edicts and N.B.P. pottery there. In fact, the major early historic levels of the peninsular south are found in this sub-region. Among the raw materials that were being imported into the region, some amount of silver was probably coming from Karnataka. Silver was also available in Central Asia from where lapis lazuli was reaching Andhra, as the seventy-six beads from Raigir suggest.

Tamil Nadu

With no cultural hiatus in-between, the neolithic horizon merged into the iron age which, as in the rest of the south, was dominated by the megalithic class of monuments whose earlier chronological limit seems to be in the pre-Sangam epoch. Megalithic sites are found in the Thanjavur, South Arcot, North Arcot, Chingleput, Tirunelvelli, Salem, Coimbatore and Madurai districts (*I.A.R.* 1983–4:78–170; 1980–1:65; 1979–80:68; 1968–9:32; 1965–6:22; 1962–3:13; 1957–8:38; Banerjee 1956, 1966). According to Ramachandran (1980:37), the early historic period which is a continuation of the iron age, marked with the intrusion of russet-coloured ware seems to have commenced during the fourth-third centuries BC. One of the major early historic sites was Kaveripattinam which, furthermore, had a wharf arrangement in its suburb. The literary references such as those in the *Mahabharata* to Vaidurya, coral and pearls from the south going to north India probably belong to broadly the same chronological span (Lad 1988: 97).

The Sitewise Distribution of Raw Materials

Charts 58a–b outline the raw materials used. These include iron, copper, gold, silver, steatite, coral, shell, carnelian, agate, rock crystal and quartz.

The Evidence of Manufacture of Finished Products at Different Sites

Iron: Iron slag has been found near a site near Appukallu village (*I.A.R.* 1976–7:47) and at Odugattur (Leshnik 1974:40). At Guttur, the evidence for local smelting includes several pieces of terracotta pipes, with iron encrustation, a large quantity of slag and trough-like terracotta objects which may have served as furnaces for iron smelting and casting (*I.A.R.* 1976–7:47).

Gold: A stone mould of a goldsmith was found at Paiyampalli (Ramachandran 1980:44).

The Raw Materials Found Within the Sub-Region

Shell

The shell occurrences in the Gulf of Manaar are well known (Kenoyer 1985:301).

Iron

The iron ore deposits of Tamil Nadu have been outlined in *Geological Survey of India miscellaneous Publication No. 30* (Karunakaran 1974b: 20–1):

Salem district: A number of magnetite-quartzite bands have been found, of which the ones at Kanjamalai and Godumalai are large ones;

Dharmapuri district: The Tirthamalai deposit is noteworthy in this district;

South Arcot district: Deposits are found north-west of Manmalai, and between Budamangalam and Talankunam;

Tiruchirapalli district: Magnetite-quartzite bands have been traced near Valasiramani and Urakkarai.

Copper

Copper ore resources have been found in the South Arcot, Madurai, Chingelput, and Coimbatore districts (*Geological Survey of India Miscellaneous Publication No. 30,* Karunakaran 1947b:16–17). In South Arcot, occurrences are present in the Mamandur area, where old workings also exist. Copper mineralization occurs near Kusiyar-Alangulam in Madurai district. In Chingelput, the deposits

Chart 58 a

TAMIL NADU–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Kambarmedu*	*T. Kallupati*	*Mottur*	*Appukallu*	*Kanchipuram*	*Paiyampalli*	*Alagrai*	*Kunnattur*
Steatite		beads						
Shell	bangles	bangles		objects			bangles, beads	
Coral		beads						
Ordinary Stone		Crystal beads				Crystal beads		Quartz bead
Semi-Precious Stone		Carnelian beads. Agate beads	Carnelian bead			Carnelian beads		
Gold		beads						
Copper/ Bronze		coins, pin, lid fragment	bowl, deer figurine, bangle		objects			bowl, bell
Iron	sickle, nails	pieces, wedge, dagger	chisels, knives, daggers, object	slag	objects	arrowhead, slag, spearhead fragment, knives, sickles, nails	objects	celts, spearheads, knives, nails, daggers, adze, chisel, bracelets

Chart 58 b

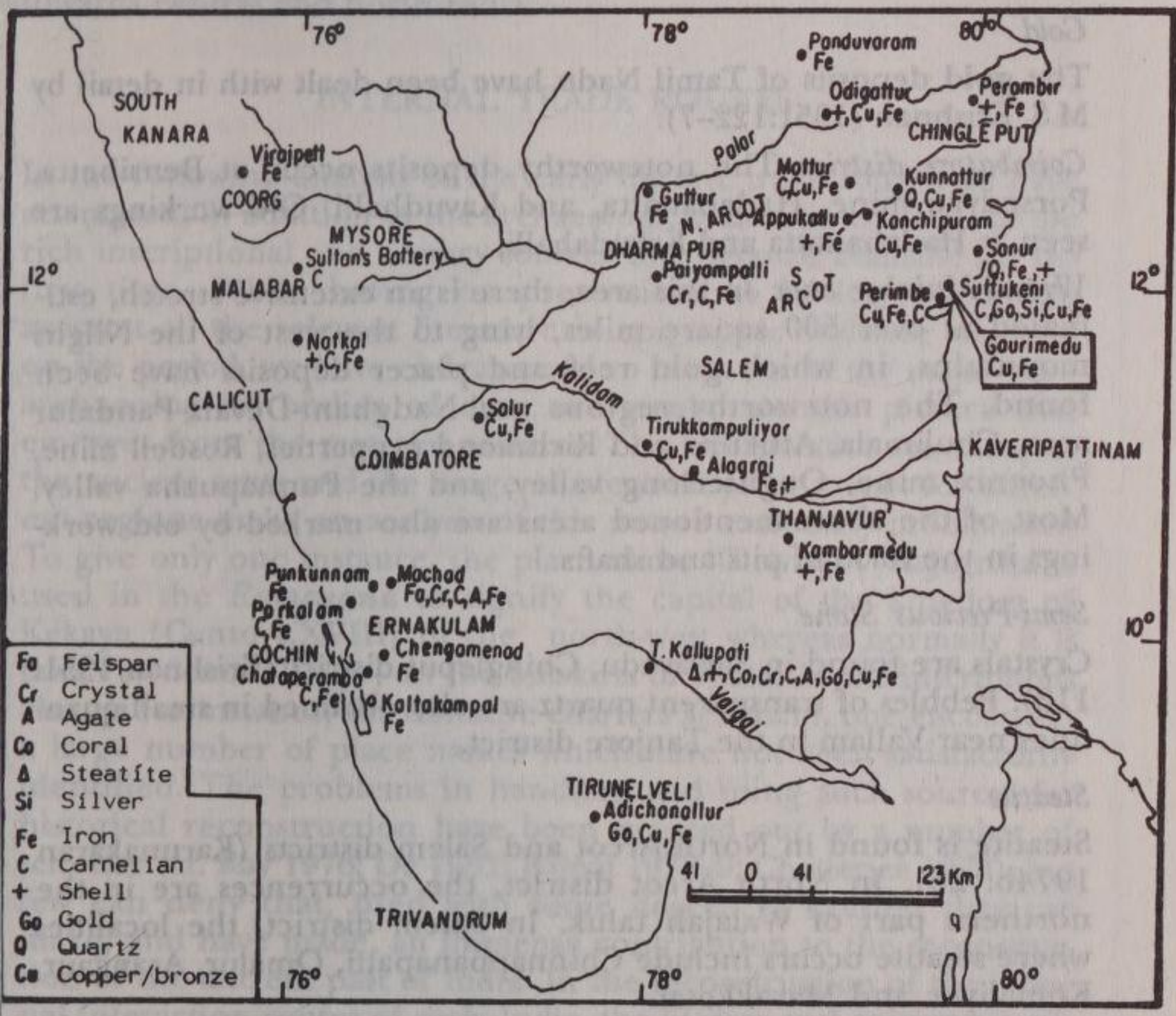
TAMIL NADU–THE PERIOD BETWEEN 1000 BC AND 200 BC

Raw Material	*Addichanallur*	*Natkal*	*Tirukkam-Puliyur*	*Odigattur*	*Perimbe*	*Panduvaram Dewal*	*Suttukeni*	*Sanur*	*Gaurimedu*	*Perambir*	*Sultan's Battery*	*Salur*
Shell		necklace		discs, ornaments				discs, ornaments		ornaments		
Ordinary Stone								Quartz ball				
Semi-Precious Stone		Carnelian beads			Carnelian beads		Carnelian beads				Carnelian beads	
Gold	ornaments, diadems, plating						bracelets, necklaces, foil, earrings, beads, pendants					
Silver							beads					

(Chart 58 b contd.)

Raw Material	*Addichanallur*	*Natkal*	*Tirukkam-Puliyur*	*Odigattur*	*Perimbe*	*Panduvaram Dewal*	*Suttukeni*	*Sanur*	*Gaurimedu*	*Perambir*	*Sultan's Battery*	*Salur*
Copper/ Bronze	cups, bowls, bangles, lids, jars, sieves, dishes, animals, anklets, rods, ring, necklaces		objects	discs, sheet	bangle		mirrors, lids, vase, bells		bracelet	coins		bowl
Iron	objects, ring, hoes, horse bits, tridents	tweezers, bangles, axe, knife, hook, spear point, chain piece	chisel head, spike, fragment, arrowheads, blade, rod, knife blade	sword, dagger fragments, axe heads, knives, spearheads, plates	celts, sickles, blade fragments, swords	sword	sickle, blade, wedge, knife, sword fragments	chisels object, bar, rod, spear, arrowhead, sickle, horse bit		implements, weapons, arrowhead, blades		dagger

Map 44



THE PERIOD BETWEEN 1000 B.C. AND 200 B.C. – SITEWISE DISTRIBUTION OF RAW MATERIALS IN TAMIL NADU AND THE SOUTH WESTERN COAST

are near Narayanapuram. Near Godepalaiyam and Maranur, in Coimbatore district, copper occurrences have been noted.

Gold

The gold deposits of Tamil Nadu have been dealt with in detail by M.S. Krishnan (1951:122–7):

Coimbatore district: The noteworthy deposits occur at Bensibetta, Porsedyke mine, Hadabanatta, and Kavudhalli. Old workings are seen at Hadabanatta and Kavudahalli;

Wynad-Malabar area: In this area, there is an extensive stretch, estimated at over 500 square miles, lying to the west of the Nilgiri mountains, in which gold reef and placer deposits have been found. The noteworthy regions are Nadghani-Devala-Pandalur area, Chulimala, Attikuna and Richmond properties, Rosdell mine, Phoenix mine, Oughterlong valley, and the Punnapuzha valley. Most of the above-mentioned areas are also marked by old workings in the form of pits and shafts.

Semi-Precious Stone

Crystals are found in Satyavedu, Chingleput district (Krishnan 1951: 118). Pebbles of transparent quartz are also obtained in small quantities near Vallam in the Tanjore district.

Steatite

Steatite is found in North Arcot and Salem districts (Karunakaran 1974b: 26). In North Arcot district, the occurrences are in the northern part of Walajah taluk. In Salem district, the localities where steatite occurs include Chinnappanapatti, Omalur, Arangaur, Komaliyur and Marakkotai.

The Raw Materials Available Outside the Sub-Region

KARNATAKA

The presence of silver and some semi-precious stones has already been noted (pp. 204–5, 209).

Ceramic and Other Artefactual Links

No published evidence is available on this issue.

Discussion

There were a number of flourishing sites in this period in Tamil Nadu with rich artefactual repertoires, which, in most cases, could avail themselves of the raw materials found within the sub-region itself. The limited silver artefacts probably came from Karnataka in

either a finished or unfinished form. It is possible that coral, pearls and shell from Tamil Nadu were sent across the southern peninsula towards central and north India.

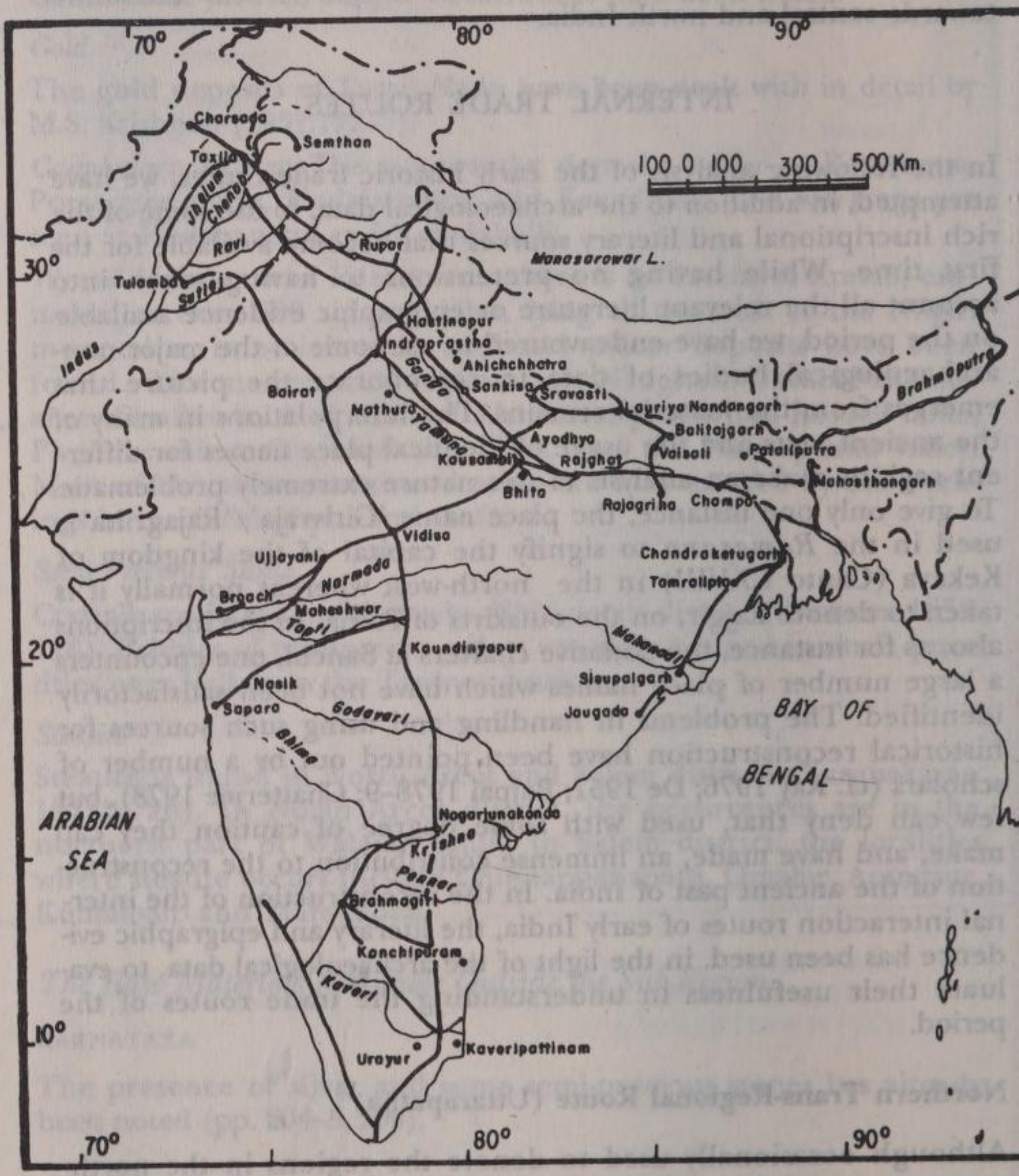
INTERNAL TRADE ROUTES

In the following analysis of the early historic trade routes, we have attempted, in addition to the archaeological data, to use some of the rich inscriptional and literary sources that become available for the first time. While having no pretensions to having taken into account all the relevant literature or epigraphic evidence available on the period, we have endeavoured to use some of the major non-archaeological bodies of data to corroborate the picture that emerges from the material remains. The interpolations in many of the ancient texts and the usage of identical place names for different regions make an analysis of this nature extremely problematic. To give only one instance, the place name 'Girivraja'/'Rajagriha' is used in the *Ramayana* to signify the capital of the kingdom of Kekaya (Canto LXVIII) in the north-west whereas normally it is taken to denote Rajgir, on the outskirts of Patna. In the inscriptions also, as for instance, the donative charters at Sanchi, one encounters a large number of place names which have not been satisfactorily identified. The problems in handling and using such sources for historical reconstruction have been pointed out by a number of scholars (cf. Ray 1976; De 1951; Bajpai 1978–9; Chatterjee 1978), but few can deny that, used with some degree of caution they can make, and have made, an immense contribution to the reconstruction of the ancient past of India. In the reconstruction of the internal interaction routes of early India, the literary and epigraphic evidence has been used, in the light of the archaeological data, to evaluate their usefulness in understanding the trade routes of the period.

Northern Trans-Regional Route (Uttarapatha)

Although occasionally used to denote the regions in the north-western part of the subcontinent, the term *Uttarapatha* has been understood primarily in the literature on the subject to describe the major grand route in northern India which cut across the subcontinent, originating in the western regions beyond India and sweeping across the Indus and Gangetic plains to the port of Tamralipti on the eastern coast. The configuration of the route along the Hindukush-Iranian region will be discussed subsequently. For the present section, we propose only to look at its internal ramifications, initially focusing on the literary data on the basis of which it

Map 45



INTERNAL TRADE ROUTES IN THE CONTEXT OF THE PERIOD BETWEEN 1000 B.C. AND 200 B.C.

has been historically described and, subsequently, on the archaeological correlates that throw material light on the nature of movement and on the common cultural traits along this axis.

The route was christened as such first by Panini (c. 500 BC) whose *Asthadyayi* noted the various kingdoms along the *Uttarapathenahritam* (V, 1, 77. cited in Agrawala 1953:244). Sections of the route, however, have also been described in the epics. The *Mahabharata*, for instance, noted Bahudhanyaka (Ludhiana), Sairshaka (Sirsa) and Rohtika (Rohtak) between Pathankot and Rohtak (2. 29 5–6). The *Ayodhya Kanda* (Canto LXVIII) of the *Ramayana*, also outlined the route along which the messengers sent by Vasishta from Ayodhya to Kekaya travelled—going to the farthest point of the Apartala mountain, and then along the river Malini to the northern side of the Pralamba mountain, they crossed the Ganga at Hastinapura, then going across the Panchala country and passing through the Bahlika region, they are said to have reached Girivraja. However, nowhere in the epics do we find the expression *Uttarapatha* occurring or denoting a grand trunk route uniting diverse sections of the subcontinent. Literally speaking, *Uttarapatha* comes alive only in the sixth-fifth centuries BC, details about it and its uses in a variety of contexts becoming available in the Buddhist literature, (primarily the *Jatakas* and the *Vinaya* texts), a period when, to underline once again, it was also similarly classified by Panini.

Although *Uttarapatha* had two major sectors, one the northern route proceeding from Lahore through Jullunder across to Saharanpur and along the Gangetic plains, through Bijnor, Gorakhpur towards Bihar and Bengal, and the other the southern sector which proceeded from Lahore to Raiwind, Bhatinda, Delhi, Hastinapur, Kanpur, Lucknow, Varanasi, Allahabad towards Pataliputra and Rajagriha, ancient Indian literature clearly suggests a large number of feeder routes and combinations. These permutations can be clearly gauged from a reading of the first two chapters of Moti Chandra's (English edition, 1977) masterly *Sarthavaha*. By way of example, we may note that while the *Ramayana* described the route from Ayodhya through Hastinapur, across Kurukshetra, the Saraswati, Sirhind, Sutlej and Beas rivers to the kingdom of Kekaya, which is understood to have been in the Punjab, the *Bannupatha Jataka* described the movement of a caravan of five hundred carts from Benares across a sand desert of sixty leagues—this could only have been the tract to the west of eastern Punjab,

* The Bharatiya Vidya Bhawan editions of the *Ramayana* and *Mahabharata* have been used for the present section. Additionally, N. Raghunathan's edition (1981) of the *Ramayana* has been used.

and this shows a route which was away from both the northern and southern sectors of *Uttarapatha* described above. It would therefore be accurate to see *Uttarapatha* as subsuming many minor and feeder routes, all integral parts of the trans-regional northern axis.

The nature of movement along the *Uttarapatha* is evident from the literary sources. Moti Chandra (1977:12) summarized the instances in Buddhist literature of merchants from Varanasi, Sravasti and Soreyya (Soron in Etah district) who went to Taxila for trade. Taxila also attracted students who came there to study from *Madhyadesha*—the *Dummedha* and *Ummadanti Jatakas* mention such movement towards Takkasila (Rhys Davids MDCMXXIX: Nos. 50 and 527). Sections of the route were also delineated in the context of the movement of professional people—Jivakumarabhrtiya, the great physician and a contemporary of the Buddha proceeded from Taxila via Bhadramkara (Sialkot area) to Udumbara (Pathankot) and Rohtika (Rohtak) (*Vinaya* cited in Moti Chandra 1977: 15).

Uttarapatha's importance as a subcontinental route in the Mauryan period is evident from the fact that Chandragupta Maurya from Magadha is supposed to have reached the Indus river where he met Seleucus, the Greek envoy in 305 BC, in his attempt to extend his newly created Mauryan empire westwards from the Ganges valley. Subsequent to this meeting, Megasthenes reached Pataliputra through this route. Additional information on the sector between Vahlika and Taxila, described as the *Haimvatamarga* comes from the *Arthasastra*.

Archaeological information bearing on the movements along this trade route is of various kinds. The distribution of P.G.W. settlements from the end of the first millennium BC onwards clearly suggests the presence of a broadly common cultural zone cutting across various sub-regions of the northern section of the Indian subcontinent. Such sites are found from the Bahawalpur region, through most of the Indo-Gangetic divide from Faridkot to Delhi, and in the large number of districts in the upper Gangetic plains, which in fact is the core-region of that culture. Its primary distribution zone, however, ends here, with only very limited late elements of this ceramic type being found in the middle Gangetic plains, at sites like Kausambi and Vaisali.

By the first phase of the early historic, however, the *Uttarapatha* of the literary tradition had become an archaeological reality. The presence of common cultural elements whether in the form of the art idiom of the period (as, for instance, the presence of the winged figurine which is found in the archaeological repertoires of sites stretching from the Gandhara region to Tamralipti) or the more

mundane artefacts such as bead shapes, spindle whorls, terracotta discs etc. is extremely striking. Among the most important indicators is the distribution of the N.B.P. and its related pottery all along this axis. To summarize the basic evidence, such pottery types are found in the north-west at Charsada, Udegrama and Taxila, in the Ludhiana, Sirsa, Hissar, Ambala, Jind, Rohtak, Patiala, Kurukshetra, Sangrur, Amritsar, Faridkot, Gurdaspur, Jullunder and Bhatinda districts of the Indo-Gangetic divide, and in the upper Gangetic valley districts of Mathura, Agra, Aligarh, Meerut, Bulandshahr, Saharanpur, Bijnor, Etawah, Farukhabad, Mainpuri, Budaun, Unnao, Hardoi, Muzaffarnagar, Etah, and Lucknow. In the middle Gangetic plains, N.B.P. and its associated wares have been found in the Gorakhpur, Basti, Varanasi, Allahabad, Mirzapur, Fatehpur, Jaunpur, Azamgarh, Deoria, Gaya, Patna, Saran, Nawadah, Rohtas, Madhubani, Shahabad, Monghyr and Purnea districts. Further along the lower Gangetic plains. N.B.P. pottery has been found in the Burdwan, Bankura, Birbhum, Midnapore, 24 Parganas, Sundergarh, Bogra, Dinajpur and Rajshahi districts.

Secondly, certain artefacts of specifically non-local origin found in the archaeological repertoires of the sites along this axis also help in amplifying the nature of movement along this route. For instance, lapis lazuli, coming from Central Asia and Afghanistan is found at the following sites along this axis—Bir Kot Ghundai, Taxila, Sravasti, Rajghat, Prahladpur and Pandu Rajar Dhibi—ie., from the Swat valley till the Burdwan district of Bengal. Similarly, Mathura and Chunar sandstone artefacts, in addition to the Asokan monoliths in this stone which were transported to various regions are found at Taxila. Thirdly, coins of silver, a raw material found in the Western and eastern regions along this axis ie., in the Central Asian/Afghanistan region beyond the north-west or in the Bhagalpur and Rajmahal areas, are uniformly found in most of the sub-regions along this route—Shaikhan Dheri, Taxila, Sanghol, Nagar, Sugh, Hastinapur, Sugh, Sanchankot, Bhagwantpur, Godapali, Atranjikhera, Ganwaria, Prahladpur, Vaisali, Chandraketugarh and Bangarh. Additionally, some early historic sites in the upper and middle Gangetic plains such as Sravasti, Piprahwa, Ganwaria, Rajghat, Vaisali and Lauriya Nandangarh were procuring some semi-precious stones, such as topaz and amethyst, and possibly some chalcedony, carnelian and jasper as well, from the Rajmahal, Singhbhum and the Dhalbhum regions. Steatite was also a part of the general movement of raw materials from the lower Gangetic plains to the middle and part of the upper Gangetic valleys. Sites in the middle Gangetic and the lower Gangetic plains—Rajghat, Prahladpur, Vaisali and Bangarh—were receiving sea shell from the eastern coast.

The distribution of the find spots of Asokan epigraphs also helps in defining the route in the first phase of early historic India. The Lauriya-Nandangarh and the Lauriya Araraj inscriptions in the Champaran district clearly were along the route towards the Nepalese *terai* where Asokan epigraphs are found at Lumbini Grama and at Nigali Sagar. Another branch from Bihar went along the Barabar hills through Sasaram towards Benares and Kausambi, Asokan edicts being found at all the above-mentioned places. From Benares the route entered the Indo-Gangetic divide at Meerut (where an Asokan edict was found), and crossing Delhi, where at Srinivaspuri a rock inscription was inscribed, it went across to Topra Kalan in Haryana. Going across the Punjab, if the find spots of the Asokan inscriptions are any indications, the route went to Taxila from where Mansehra in the Hazara district and Shabazgarhi in the Peshawar region were approached. The spread of Asoka's *Dhamma* into Afghanistan was further along this axis.

The distribution of coin types along this axis also throws historical light on the general direction of movement. Mauryan coins or coin types, in the form of some punch-marked coins, for instance, have been found by gold panners in the Kabul river near Peshawar, and at the Bhir mound at Taxila (Mitchiner 1975, volume 4: 309). On the other hand, the radiation of Indo-Greek influence is reflected in the silver issues struck by the Audumbara-Vemaka-Vrishni-Kuninda-North Yaudheya group/s; the basic numismatic evidence of the overlapping Indo-Greek and tribal frontiers is summarized in Mitchiner's (1975, volume 4: 326) survey of *Indo Greek and Indo Scythian Coinage*. The silver drachms of the Audumbaras, whose coins have nearly always been recovered from the Beas valley, are struck on the Indo-Greek weight standard. Similarly, the Vrishnis of eastern Punjab struck a scant coinage of silver drachms of the Indo-Greek weight standard during the second half of the second century BC. In many of these regions, Indo-Greek coins have also been found: 28 Indo-Greek drachms of Apollodotus II near Jwalamukhi in the Kangra, 11 silver drachms of Apollodotus near Ambala, Apollodotus coins at Sugh, 21 drachms of Apollodotus II in the Hamirpur district. The distribution of Indo-Greek coins, in fact, is clearly along the first leg, so to speak, of the northern sector of the northern trans-regional route.

The presence of an important feeder route emanating to Rajasthan in this period can also be postulated if the above elemen ie., N.B.P. pottery, non-local raw materials, Asokan edicts etc. ca be considered as indiçative of such an alignment. The presence of the Bhabru and the Bairat inscriptions in the Matsya janapada well known. Additionally, Chunar sandstone came to Rairh fro

Mirzapur. Rajasthan, being one of the most minerally rich regions in northern India, with important contemporary early historic sites using most of the region's raw materials, supplied many minerals to the Indo-Gangetic divide and the Gangetic valley itself. From the Jaipur, Udaipur and Jhunjhunu districts, among others, came semi-precious stones and metals like copper and iron, and probably some silver, lead and gold as well. The ceramic types of the Indo-Gangetic divide and the Gangetic plains are also present here. While the P.G.W. phase can be seen in the Jhunjhunu, Alwar and Jaipur districts, the subsequent N.B.P. phase is encountered in the Bhilwara, Jhunjhunu, Jaipur, Bharatpur, Chittorgarh and Ajmer districts. While the issue of an Indo-Greek invasion of Rajasthan in the closing centuries of the Christian era is open to debate, what cannot be denied, however, is the movement of people and goods from the north-western sector of the grand route to the region. Turquoise and lapis lazuli were coming to Rairh from Central Asia and Afghanistan. Rajasthan, in turn, was supplying a number of semi-precious stones to Taxila, including the much-mentioned *vaidurya* or beryl. The coins of the Sibi janapada at Nagari have been generally understood as being indicative of the movement of the Sibis from Punjab in the north-west. The Indo-Greek coins at Bairat, Rairh, Ahar, and Dada Fatehpur also came to Rajasthan through the Punjab where at Ajaram, Sugh, Ropar and Theh Polar similar coins were recovered.

That feeder lines also joined the main trunk route from Sind is suggested by the presence of conch and other shell artefacts at a number of sites along this axis—Balambat, Shaikhan Dheri, Taxila, Agroha, Daulatpur, Ghuram, Rupar, Jodhpura, Rairh, Ahar, Mathura, Atranjikhera, and Sravasti. Although the historians of Alexander do mention a number of kingdoms in the Sind in the fourth century BC, these references are not substantiated by any contemporary archaeological remains, and thus, at the present state of research, one cannot claim with any degree of accuracy that any organized caravan trade existed between the Sind and regions to its north. In extenuation, we may mention that shell travelled from coastal Sind from the Pre-Harappan period itself through the second and first millennium BC till the 2nd century BC and may have reached across to the Gangetic plains as a part of this age-old traffic.

On the eastern flank of the *Uttarapatha*, an important feeder route went across from West Bengal to the Orissa littoral. The basic evidence is as follows: the presence of Chunar sandstone from the Mirzapur district, and carnelian, agate and silver from the Chhotanagpur plateau in Orissa; silver punch-marked coins at Asurgarh; N.B.P. pottery at mounds in the Sundergarh district; Asokan edicts at Jaugada and Dhauli. Literary evidence of interac-

tion along this axis comes from the Buddhist account of two merchants of Utkala, on their way to Magadha who first gave honey to Buddha at Bodhgaya (cited in Acharya 1955:44). The Hathigumpha inscription also records that, in the twelfth year of Kharavela's reign, the wealth of Magadha and Anga was looted by him (cited in Chaudhary 1983:97). Acharya (1955:45) has outlined the possibilities of communication from Orissa to the north. The first road from the southern bank of the Brahmani went to Jajpur and then northwards up to Midnapore via Dharmanagar, Bhadrak, Soro, Remuna, Ramchandrapur, Garhpada, Basta, Amarda, Raibania, Ganganeswar, Kesiari and Kharagpur. From Midnapore it stretched to Garh Mandaran from where it bifurcated, one branch heading towards Burdwan and the other towards Saptagram on the Ganges. The second route stretched in a north-westerly direction through Keonjhar and, following the Baitarani valley, it reached west Mayurbhanj. From here it went to Bahalda in Mayurbhanj from where, following a northerly direction via Saraikhela to Manbhum district, it reached the Subarnarekha valley. The journey to Gaya or Patna, thereafter, was fairly simple.

That the rivers were important arteries of communication is quite evident from both the archaeological and literary sources. The distribution of P.G.W. and N.B.P. sites along the Ganga, Jamuna, Ghaghara, and the Sarayu clearly suggests the continuing importance of these routes as trade channels. The Buddhist literature underlines the movement of country boats along the Ganges as far as Sahajati, along the Yamuna as far as Kausambi, downwards along the Ganges as far as Champa and Tamralipti (cited in Rhys Davids 1903:103). The *Samudda-Vanija Jataka*, for instance, narrated the story of the village of carpenters near Benares who, failing to deliver the goods for which they had been paid in advance, built a ship secretly, embarked with their families, went down the Ganges and out to an island overseas (cited in Mookerjee 1912, reprint 1957:51–2). Similarly, the *Mahajanaka Jataka* which recounts the adventures of a prince who set out from Champa for Suvarnabhumi also suggests that the Ganga was navigable from Bhagalpur till the sea.

What is, however, relatively important is the emergence of land routes along this axis in the early historic period for the first time. Buddhist and epic literature is replete with such references. The Buddha, for instance, is most often depicted in the *Jatakas* as travelling along roads—it is in the context of one such tour that the king of Rajagriha asked the Buddha not to proceed from Mithila until he had completed repairs along that road (*Dhammapadatthakattha*, cf. Law 1932, reprint 1973:9). Similarly in the Sabha Parva of the *Mahabharata*, Krishna, Bhima and Arjuna on their mission to kill

Jarasandha, first crossed the river Sarayu and the Gandaki. After crossing Mithila, they went in the direction of Magadha, crossing the Ganga in the process. In the Bala Kanda of the *Ramayana*, after clearing Siddhasrama, Visvamitra along with Rama and Lakshman went north, halting on the bank of the Son. Crossing the Son, they reached the Jahanavi ie., the Ganga across which they were ferried, and came to the city of Visala from where, after spending a night, they went on to Mithila. Even the route taken by Rama, Sita and Lakshamana from Ayodhya towards the Vindhyas, which could very well have been along the rivers, was a land route involving the crossing of many rivers from the Tamasa to the Ganga. Ferries, incidentally, are mentioned in a number of ancient texts—Panini refers to a boat ferry as *navya* (IV. 4.9, cited in Agrawala 1953:155) while the *Jatakas* call it *nava-tittha* (Cowell 1901, reprint 1956, *Jataka* III, 330). That these ferries were often controlled by the state authority is evident from the *Divyavadana* where the Buddha is known to have told the Bhikkus that, in order to go to Rajagriha from Sravasti, one could cross the Ganges by boats kept either by king Ajatasatru or by the Licchavis of Vaisali (cf. Law 1932:10).

We would like to here refer to the travels of Leopold Von Orlich (1845, reprint 1985, Volume II) whose journey from Delhi to the lower Gangetic plains, in a palanquin, was completely along a land route. This German army officer's travels, in which the distances between many different points and the advantages of land routes along this axis over water routes were noted, were along the southern sector of the early historic *Uttarapatha* (Orlich 1845:41–173). Travelling first from Delhi to Agra via Aligarh, Orlich took 39 hours, crossing the Yamuna by the bridge of boats opposite Agra. From Agra, he left for Kanpur, a distance of 130 miles which took 24 hours, going through Mainpuri district. From Kanpur, he commenced his journey to Allahabad (129 miles distant). From Allahabad he was carried along the right bank of the Ganges, which was 'at this time, scarcely 600 paces wide, but in the rainy season, its waters fill the entire bed, which is a mile in width' crossing it by a bridge of boats to the opposite village of Daraganga. He then proceeded to Benares, from where he travelled along the fertile, richly cultivated valley of the Ganges for the first eighteen hours, gradually ascending the offsets of the Vindhyan chain, past Sasaram crossing the river Son at the village of 'Deury'. He then reached the hills of the 'Puharri', on to 'Dumry' arriving at Burdwan from where he proceeded to Hooghly and Calcutta which, in his opinion, was the most frequented road of all in India. Orlich gave two reasons for the land route being preferable to the riverine route. Firstly, he noted that while the distance from Allahabad to Calcutta by way of Benares was 488 miles by land, by

water the distance was about 800 miles, on account of the winding nature of the Ganges. Secondly, the land journey took less time—merchant wagons did not take more than six or seven weeks in completing the journey from Burdwan to Kanpur while in a boat the same distance took four, sometimes even six months. Kautilya's *Arthasastra* (7.12.20. Kangle's translation 1963 [part II] :47) also expressed similar sentiments: 'The water route is restricted in movements, not usable at all times, a source of great dangers and without remedies; the land route is the opposite of this.'

As regards the northern sector of *Uttarapatha* in the Gangetic valley, a section of it from Rajgir till the Sarayupara plains is described in the *Mahaparinibbana Suttanta (Digha Nikaya*, cf. Law 1932:15). In the above-mentioned text, it is noted that the Buddha, from Rajagriha went to Amabalatthika, Nalanda, on to Pataligama where he crossed the Ganga. Then, he went on to Kotigama and Vaisali where, while staying at the Capalya Cetiya, the Buddha resolved to die in three months. He then went to Pava, via Bhandagama, Hatthigama, Ambagama, Jambugama, Bhoganagara etc. From there he proceeded to the Sala grove of the Mallas near Kusinara and died. The presence of Asokan edicts at Lumbini and Nigali Sagar and the construction of a number of monuments by Asoka at the former place indicate that it continued to flourish during the Mauryan period. Whether the route went from the Gorakhpur region to Lumbinigrama in Nepal is not known. According to Oldfield (1974: 137), the country west of Gorakhpur was full of swamps and deep *nullhas* of which the water was poisonous. Oldfield (1974: 138), however, noted other more practicable routes to Nepal:

> There are three principal passes by which an army may enter within the lower ranges of hills from the side of Bettiah and Tirhut, viz., in the centre, that of Cherya Ghatti by Bichakoh; on the left and west, that of the Gandak; on the right or east, that of the Baghmatti. The route of the Baghmatti is probably the easiest, as it is by this route that crowds of buffaloes and other cattle comes to Nepal.

Oldfield also noted that the Gandak river was navigable for large boats up to Mutabanni, and for small boats within a few miles of its junction with the Rapti, during the whole year. According to Regmi (1971:20), through the *terai* region of Nepal, agricultural and other primary produce used to go in the nineteenth century to distant places in the Gangetic plains such as Patna and Murshidabad.

This movement of cultural traits and commercial traffic along the land routes in addition to the rivers is also suggested by the archaeological data. The micro-study of the Kanpur district by Makhan Lal (1984a, 1984b), for instance, clearly demonstrates this trend. According to the protohistoric and early historic settlement

distribution, whereas in the P.G.W. period, only six out of a total of forty-six sites are located away from the river banks, by the N.B.P. phase about 30 per cent of the sites are away from the rivers, going beyond the locales preferred in the preceding protohistoric period.

Potwar Plateau—Kashmir

The continuance of traffic along the line emanating from the Potwar plateau to Kashmir is reasonably clear. The artefacts and traits of north-western provenance or traits mediated through that region found in Kashmir include the presence of N.B.P. related red pottery at a number of sites and Indo-Greek coins at unspecified sites.

Theoretically, the N.B.P.-related pottery could have reached the Kashmir valley through the Jammu region. However, the absence of any early historic remains in the region between Manda and the Kashmir valley, invalidates any suggestion on the Banihal pass being the conduit. On the other hand, the distribution of these sites shows a concentration in the Baramulla district with sites at Bunagantmula, Drangbal, Kanispur, Mulsama and Bambyar (*I.A.R.* 1981–2:16–17). That the route continued through the Pulwama and Anantnag districts is evident from the presence of early historic levels at Semthan and Gufkral. At Semthan, as already noted, Indo-Greek artefacts and a Kharoshthi inscription of the second century BC also suggest interaction along this route.

While interaction continued along the route that had taken shape during the neolithic period itself, two important changes, in relation to the preceding period, may be highlighted. Firstly, although there are N.B.P.-related sites along the Jhelum valley, their number is significantly less than in the preceding protohistoric period. Whether this first phase of the early historic was relatively less populous needs to be examined. Secondly, whereas the route from Kashmir in the preceding neolithic-chalcolithic period was directed towards the Swat and Dir regions, in the early centuries BC, it was the Taxila valley which had become the locale for the most important city state of the entire north-west region, towards which movement from Kashmir came to be directed. Both these roads ie., one towards Peshawar and the other towards the Potwar, incidentally, follow the Jhelum (Drew 1875, reprint 1971:206): 'There is a road along each side of the Jhelam valley; that on the right bank leads to Muzafarabad and Abbotabad; that on the left bank is the one which, leaving the river after some marches finds its way to Mari.'

North West Frontier Province-Potwar Plateau—Coast

The major archaeological evidence of interaction along this axis comes in the form of the presence of various non-local raw materials in the North West Frontier province and the Potwar region, which had their sources in regions to the north (Central Asia and China) and towards the coast. At Taxila, schist from the North West Frontier province, lapis lazuli, silver and gold from Central Asia, amber through China from Burma but mediated by the northwestern region, and shell and coral from Sind are found. In the North West Frontier province sites like Charsada, Balambat, Aligrama etc., lapis lazuli, silver and gold from Central Asia, carnelian and agate either from the Potwar region or from Waziristan and shell and coral from Sind were being imported.

In fact, the cities of Taxila and Charsada were caravan cities in the true sense of the term, mediating commercial, political and cultural influences in a number of directions. These regions, incidentally, in the subsequent periods, have often seen such notable metropolises firstly, because of their strategic location and secondly, whenever the trans-Iranian and Asian regions have come to play an important socio-cultural role in the life of the subcontinent. Many evocative descriptions of the character of such cities are available (see Holdich 1901; Dichter 1967), the following account of Enriquez (1909:53–5) on Peshawar, located on the Yusufzai plain where, in the first phase of the early historic, the imposing Bala Hissar stood, being one example:

> In its streets India meets Central Asia, and of the crowds which throng its bazaar fully thirty per cent, are travellers on their way to and from Hindustan, or are strangers from the neighbouring Pathan mountains.
>
> Each tribe has its own Caravansarai where its members have a *charpai*, and deposit their belongings. Swatis swathed in gay Malakand blankets, handsome featured Afridis from the neighbouring hills, spotlessly clad Yusufzais with flowing pyjamas and exquisite love-locks, jostle each other in the main thoroughfare of the city, and percolate through the motley crowd of Peshawaris. . .
>
> Occasionally may be seen Uzbegs, Russian subjects from Kokhand, in quilted, long-sleeved coats. The materials of Bokhara and Samarkhand carry on an important trade with Peshawar. Last of all come the fair skinned Chitralis, representing an entirely different type. They saunter about in their embroidered Chogas or cloaks with the usual yellow or purple flowers stuck gaily in their roll-up caps. It is an interesting crowd to study, for it is essentially cosmopolitan.

The distribution of early historic settlements throws important light on the route/s of movement along this line. From the Chitral valley, where Narghormuri and Bakamak were located, the route went to Chakdara—Timargarha, is situated on this main road from Chakdara to Chitral. From here the route went into the Swat region where a large number of sites were located, including Barama,

Butkara, Tarike, Lalbatai, Sogalai and Pulanr. Going through the lower Swat valley ie., the Malakand Agency, the Shahkot pass gave a direct access into the Peshawar valley where Charsada and subsequently, Shaikhan Dheri flourished. Taxila, in the Potwar plateau, was conveniently accessible from the Peshawar plains.

Additional information on this line of movement is also available in the contemporary extant literature. Notices of movement from the north-western frontiers of the subcontinent through the Punjab and Sind to the coastal regions of Baluchistan occur in the context of the Achaemenid occupation of north-west India and, subsequently, during Alexander's invasion. As far as the Persian invasions are concerned, on the testimony of Herodotus, Ctesias, Xenophon, Arrian and Strabo, it is reasonably clear that by the time of Darius, the Achaemenian empire's satrapies included the north-west of India (Jackson 1921:300). That the Persians followed a route which went through the Chitral region to the Indus is suggested by animal drawings, with distinctive forms of stylization of the Achaemenid court. During this period also, we are told that in 517 BC, Darius despatched Scylax of Caryanda on a voyage which began from a city called *Kaspatyros*, situated possibly somewhere along the lower end of the Kabul river and which, after going down the Indus, reached the Indian ocean, ultimately moving up to Egypt one and a half years after the voyage began (Jackson 1921:301). This clearly suggests that navigation from the north-west frontiers down the Indus was undertaken.

The invasion of India by Alexander the Great, a personage mythically associated in the north-west even till the late nineteenth century with any unusual relics, including *gabarbands*, also throws historical light on the routes of movement along this axis. The route/s basically followed the movements of the Achaemenids, a point underlined by Moti Chandra (1977:48):

> Foucher is of the opinion that the campaigns of Alexander were modelled after the campaigns of the Achaemenians as Alexander was much influenced by the Iranians. He adopted their religion and the administrative methods of Darius III. perhaps this was essential for re-establishing the political boundaries of the Achaemenians. Foucher again draws our attention to the refusal of Alexander's soldiers to proceed beyond the Beas river; it was not due to the fact that they were tired, but because they had re-established the boundaries of the ancient Iranian empire and, therefore, it was not incumbent upon them to go beyond it. When puzzled and angry Alexander returned by the way of the Indus to Iran even then he was taking the same route which Darius I took.

Although there is some element of exaggeration in the above statement (the Achaemenids had never reached the Beas, for instance), broadly the itinerary of Alexander corroborates it. We are told by Alexander's historians (M'Crindle MDCCCDVI) that while the main body of his troop moved along the most direct

route to Taxila, Alexander decided to move along a northern route with the intention of subduing certain tribes in that region. Major details about this route are available in Holdich's *The Gates of India* (189:96ff; also see Smith 1904). Briefly, from Kabul, Alexander went along the Kabul river on to the valley of Kunar (*Choaspes*) which 'is a link in the oldest and probably the best trodden route from Kabul to the Punjab, and it has no part with the Khaibar. It links together these northern valleys of Laaghman, Kunar and Lundai (ie., the Panjkora and Swat united) by a road north of Kabul, finally passing southwards into the plains chequered by the river network above Peshawar.' After crossing the Panjkora (*Gourajos*), Alexander subdued *Massaga* which, M'Crindle argues, seconding Rennell, was the same as the Mashanagar mentioned in Babur's memoirs, situated on the Swat river, two marches from Bajaur. His next objectives were the cities of *Ora* and *Bazira*. Going towards the Indus, Alexander received the submission of *Peukelaotis*, the capital of the then Peshawar region ie., Charsada. From Charsada, Taxila was reached. After leaving behind the dominions of Porus, around the Jhelum, he went down the river, fighting tribes along the way to reach the confluence of the rivers of Punjab with the Indus. His campaign in the Sind region is dealt with very vaguely. It is sufficient to mention that the march followed mainly the line of the river towards the sea and towards Gedrosia.

Gangetic Plains—U.P. Himalayas

The procurement of diverse raw materials from the Kumaon and Garhwal Himalayas by various cultural zones in the Gangetic plains was underlined in the context of the preceding neolithic-chalcolithic horizon. The subsequent iron-bearing horizons and early historic centres of the Gangetic plains continued to depend significantly on the mineral rich Himalayas.

Briefly, the raw materials available in the U.P. Himalayas used in the present context by the upper Gangetic valley sites are sandstone, quartzite, copper, steatite/soapstone, lead, gold, crystal, slate, limestone, iron and possibly some amount of silver. These raw materials occur in a number of districts: Nainital, Chamoli, Pauri Garhwal, Almora, Dehradun among others. In this context, the remarks of Traill (1878a:33) on the traffic between Kumaon and the plains are important where he noted the movement of many such raw materials in a nineteenth century context. Traill notes that the zamindars of the Kumaon region used to regularly migrate to the plains regions carrying iron, copper and various hill rocks, in addition to other commodities, receiving in return coarse chintz, cotton cloths, gur, tobacco, glass beads and hardware.

Striking Gangetic valley affinities are also evident in the cultural material of contemporaneous sites in the Tehri Garhwal, Nainital and Dehradun districts; for instance, the presence of P.G.W. at Thapli and Ranihat, the shapes of the former bearing impressive similarities with those of Ahichchhatra. N.B.P. pottery and/or N.B.P. inspired ceramic types have also been recovered from Ranihat, Kashipur and Bharat Mandir. In fact, the beginning of a well-defined protohistoric horizon in the Himalayas with clear Gangetic valley ceramic traits, clearly underlines the presence of a significant organized line of communication between the two sub-regions.

The Brahmanical and Buddhist literary traditions also contain a number of images of the Himalayan region, its rivers, mountains, forests etc. The *Atharva Veda* and the *Asthadyayi* of Panini, among others, noted the Himalayan mountains, among other geographical names (Law 1954: 81). Similarly, in the Adi-Parva of the *Mahabharata*, Arjuna began his pilgrimage by going to the Himalayas. Many of these descriptions are, however, highly fanciful and inaccurate, of which an instance is pointed out by Law (1954: 84):

> The Buddhist texts mention seven great Himalayan lakes: Anotatta, Kannamunda, Rathakara, Chaddanta, Kunala, Mandakini and Sihappapata. Each of them is fifty leagues in length, breadth and depth. Their description of their length, breadth and depth is too symmetrical to inspire confidence. Among the Himalayan peaks mention may be made of the Maniparvata, Hingulaparvata, Anjanaparvata, Sanuparvata and Phalikaparvata. None of them can be satisfactorily identified.

Southern Trans-Regional Route (Dakshinapatha)

Stretching from Pataliputra in Magadha to Pratishthana on the Godavari delta and terminating at Bharukkaccha and/or Sopara on the western coast, the literary image of *Dakshinapatha* is saturated with cultural, mythological and political meanings. On the onc hand, movement into the Vindhyas from Allahabad southwards has been seen in epic literature in the context of the rescinding of a cultural barrier—that both the *Ramayana* and the *Mahabharata* affirm the coincidence of Aryan movement towards the south with that of the hermit Agastya is eloquent testimony of such a sentiment. On the other hand, the literature is replete with references to 'pygmies', hunters-herdsmen in the central Indian regions as well as Rakshasas from regions to the south of the Vindhyas, suggesting that along *Dakshinapatha* the Sanskrit-based culture met an autochtonous basal cultural element there (see Jacobsen 1975:84–5). The presence of the deluxe pottery of north India (ie., N.B.P. ware) in rock shelters of the Bhopal area archaeologically

validates this intermingling (Jacobsen 1975:85). That such elements culturally infiltrated across the Vindhyas into the Gangetic plains can also be postulated on the basis of stories like the altercation between Parasurama from the eastern ghats (the famous Mahendraparvata), the son of Jamadagni, and Rama on the latter's return journey from Mithila to Ayodhya (Bala Kanda of the *Ramayana*, Canto LXXV).

However, although *Dakshinapatha*, as an arterial route through which peoples, cultures and commerce moved, is very much there in Sanskrit and Buddhist literature, relatively speaking, the literary picture is not as sharp or well defined as that of the northern trans-regional *Uttarapatha*. The historical reasons for this, whether it has to do with *Madhyadesha* being the land where most of the literature was composed or whether there are many common cultural elements in the northern regions, is not our specific concern. What is clearly apparent is that there is considerable vagueness surrounding the great Southern route and its specific alignment. The geography of Rama's exile which was basically along the *Dakshinapatha* is one such example, with many of the place-names and spots in the Deccan significant in that context, still not having been satisfactorily identified. For instance, while Janasthana has been identified by N.L. Dey (1927, reprint 1971:80) with the Aurangabad region including Nasik, according to Pargiter (1894: 247), it was probably the country around the junction of the Wainganga with the Godavari ie., the Vidarbha region. The controversy over the geographical location of Lanka, also, is far from over, undoubtedly because of the ambiguity of the *Ramayana* on its exact bearings, with learned arguments being put forward to suggest its location near Jabalpur, Amarkantaka, Ceylon and so on (an outline of these differing views is available in Sircar 1979:6–10). D.C. Sircar (1979:17), in this context, has also noted the ambivalence in the *Ramayana* on the distances covered by Rama, Sita and Lakshmana in the southern region:

> As the crow flies, the distance between Allahabad and Nirmal would be about 550 miles while similar distance between Allahabad and Nasik would be about 675 miles, the actual distances by the jungle paths of those days must have been not less than 800 and 1000 miles respectively. It is strange that the writers of the Rama story are silent about the great distances and the very considerable time and hardship involved in the travel especially for Sita.

Often, although journeys and campaigns along the *Dakishinapatha* are mentioned in the *Mahabharata* and in Buddhist literature, no details are given. The Adi Parva's description of Arjuna's *tirthayatra* to the south of the Godavari and Kaveri or Sahadeva's conquest of Bhojakatapura (possibly the capital of Vidarbha), are two such examples. Even in Buddhist literature, originally, *Dakshinapatha* sig-

nified no grand trade route but a remote settlement of the Aryans on the upper Godavari (*Vinaya Pitaka* cited in Dey 1927: 52). That Dakshinapatha was used as a territorial term is also evident from the Nanaghat inscription of Naganika (second century BC) in which Simuka Satavahana is described as *Dakshinapathapati* (Lord of the Deccan) (also see Raychaudhuri 1960).

The term *Dakshinapatha* occurs in the sense of a trade route to the south, bringing precious stones, shells, pearls and gold, in a clear and unambiguous tone in the *Arthasastra* of Kautilya (7.12.23). Buddhist literature also notes a number of merchants going from Pataliputra and Kausambi to Pratishtana on the Godavari. The clearest outline of the *Dakshiṇapatha* is to be found in the *Parayanavagga* of the *Sutta Nipata* which contains the story of Bavari, a teacher of Kosala who in the kingdom of Assaka, near the lake built a hermitage on the banks of the Godavari (Law 1932:4). Bavari is also said to have sent his disciples in a mission to the Buddha at Sravasti. Their route has been summed up in the following verses (1011–1013 summarized in Bhattacharya 1977:258): 'Patitthana of Mulaka; then the city of Mahissati; also Ujjeni and Gonaddha; Vedisa; Vana-Savhaya; Savatthi etc.' This south-north route, thus, included in its halting places Mahissati (Mahismati), Ujeni (Ujjayini), Gondaddha (Gonarda), Vedisa (Vidisa) and Vanasavhaya (Tumaun in Guna district). Alexander Cunningham (1879:2) has identified the place Wal-Sewet, which is mentioned in this context, with the Bharhut stupa. The route than went on to Kausambi and Sravasti in the north as well as Pataliputra in the east. It was also along the *Dakshinapatha* that Jivaka Kumarabhrtya, the court physician of Magadha, travelled to Avanti. In the *Sussondi Jataka* the journey of Sagga, the minister of the king of Benares, to Bharukaccha in search of the latter's wife, is briefly discussed as well (*Jataka* III, 123–5).

The historical importance of the route from Magadha and Kausambi to Pratishthana and Bharukaccha, which basically constitutes the *Dakshinapatha* of Indian literature, is also evident from the archaeological sources. The presence of P.G.W. at a number of sites in the Morena and Ujjain districts is indicative of cultural elements travelling from northern India into the Malwa plateau prior to the early historic period. In the first phase of the early historic, such common archaeological elements were, of course, more widespread. In Vindhyachal-Bundelkhand, N.B.P. pottery types have been found in the Guna, Rewa and Bhind districts. The sites bearing N.B.P. elements are found in the Ujjain, Morena, Raisen, Vidisha, Sehore, Sagar, Mandasor, Jabalpur and Nimar districts of Central India. In the Deccan, N.B.P. Ware has been found in the Yeotmal, Osmanabad, Amraoti, Ahmednagar, Bhandara districts.

The N.B.P. fragments at Timbawa, Jokha and Nagara in the Baroda, Surat and Kheda districts respectively of the Gujarat region, complete the distribution pattern of this ware. Among the raw materials that were being exchanged along this route, it is clear that the Vindhyas were providing iron, copper and various kinds of stones to the Allahabad region and other parts of the Gangetic valley. Malwa and Maharashtra seem to have had most of the raw materials that the sites of the region used. Despite Kautilya's note about 'conch-shells, diamonds, rubies, pearls and gold' coming along *Dashinapathya* (*Arthasastra* 7.12.23), our analysis of the archaeological evidence, in this regard, does not show any significant movement of raw materials from the Deccan towards north India. That Kautilya was referring to regions further south is, however, possible.

Apart from the ancient texts and archaeological repertoires of different sites, the location of Asokan edicts in many places along this route is significant: Gujjara, near Jhansi (Datia district); Rupnath, thirty-five miles from the early historic site of Tripuri, and on one of the arterial routes from Bundelkhand to the Godavari delta; Sanchi, a few kilometres off ancient Vidisa; Deotek in ancient Vidarbha; and Sopara on the Konkan coast.

The presence of Buddhist stupas and monuments, dating to the early historic period, at a number of places in central India and the donative inscriptions there of traders, artisans, guild heads, monks, nuns, and ordinary travellers, from Bihar, Uttar Pradesh, Rajasthan, central India and the Deccan also strikingly highlight the communication alignment and context in which these linkages operated. In fact, many such inscriptions and relics are found in pockets of central India which are today fairly remote and backward, in striking contrast to the hum of human movement from different regions that resounded there in the early historic period. The Jogimara cave inscription, immortalizing the love of Devadatta, a sculptor of Benares for Sutanuka, the *devadasi*, in the Ramgarh hill, 32 miles from Ambikapur, the erstwhile capital of the old Surguja state, is one such example (H. Lal 1932:183). A Buddhist stupa, dated to the Mauryan period, has been found in the Guna district, at Tumaun; this has been referred to in literature as falling on the road from Mathura to Vidisa (*I.A.R.* 1971–2:74). The remains of a Mauryan stupa have also been found at Mawai, Mandla district (*I.A.R.* 1984–5:46). The Bharhut stupa, situated at the northern end of the Mahiyar valley at the point where, as Cunningham (1879:15) underlined, the road from Ujjain and Bhilsa turned north towards Kausambi and Sravasti, and its donative inscriptions, also strikingly illuminate movement along this route. Many of the donations were made by inhabitants of Pataliputra (A 13–15 in Luders

1963), Bhojakata (ie., probably an important place in Vidarbha. A 23–24 in Luders 1963), Bhogavardhana (Bhokradan in Aurangabad district. A 51 in Luders 1963), Benakata (Dey has identified it with Warangal while Law locates it in Nasik. A 49 a in Luders 1963) Vedisa (A 30–35 in Luders 1963), and Purika (Konkan area. A 16–20 in Luders 1963).

The importance of Sanchi, a few kilometres off Vidisa, where as already mentioned, an Asokan pillar was erected, is equally pivotal. This is well indicated in *The Monuments of Sanchi* (Marshall & Foucher 1940:2):

> From first to last, the story of Sanchi was bound up with the fortunes of the great city in whose shadow its sangharama grew and flourished and on whose wealth it was mainly dependent for its support. That the foundation of Sanchi went back to a very remote age and that its population was a large one in the early centuries of Buddhism, is abundantly clear from the extent of its well defined site, as well as from the great depth of debris that had accumulated there before the second century BC. Its importance it owed in part to its commanding position at the junction of the Bes and Betwa rivers, the latter of which afforded valuable water transport during the rainy season, but still more to its position on two great trade routes, one of which ran west to east from the busy seaports of the western littoral through Ujjayini, Kausambi and Kasi to Pataliputra, the other south-west to north-east from the Andhra capital at Pratishthana to Sravasti, as well as to other cities in Kosala and Panchala.

The donative inscriptions of Stupa I, including those on the ground balustrade and the adjoining pavement slabs, which have been dated to 175–25 BC (Marshall & Foucher 1940:260), in a large number of cases mention the domicile of the donors. The place names mentioned in this context include Vidisa (no. 15, 220, 244, 318, etc [all references to inscription numbers are from Marshall and Foucher 1940: 301ff]), Mahisati (ie., Mahismati, Nos. 213, 251, 252–4 etc.), Ujjeyni (ie., Ujjain, Nos. 32, 40, 49, 53, 58, etc.), Pokhareyaka (ie., Pushkara, Nos. 101, 273, 330, 333), Bhogavadhana (Bhogavardhana, Nos. 156, 236, 237), Nandinagra (ie., Nander, Nos. 169, 170, 247, 255 etc.), Tubavana (Nos. 16–18, 20, 21), are among those that have been identified. Most of these places were situated along the great Deccan route.

From the Malwa region southwards, Buddhist relics and early inscriptions have been found in Vidarbha, on the one hand, and towards the west along the Konkan coast, on the other. The Buddhist stupa at Pauni, in the Bhandara district of Vidarbha, displaying sculptural and architectural borrowing from the Sanchi and Bharhut stupas, conclusively proves the presence of a flourishing Buddhist establishment there. This stupa, incidentally, is dated to the same period as the Bharhut and Sanchi, beginning from the 4th–3rd centuries BC and becoming a magnificient establishment by the Sunga-Satavahana times, complete with most structural elements associated with monuments of this kind such as gateways,

intricate carving, a *pradakshina patha* etc. The stupa site has also yielded N.B.P. pottery and a Mauryan silver coin, clearly suggesting the important links between *Madhyadesha* and Vidarbha. About ten miles off Pauni, rock-cut caves with inscriptions in 2nd century Brahmi, in the hills of the Phullar forest near Mandhal (Deo, cited in Sharma 1974:53), further testify to such movements. Furthermore, in the Chanda district, at Deotek, a stone inscription in Pali characters of about the same period as the Asokan edict found there, is known (H. Lal 1932:15).

As far as the communication routes of the Vidarbha region are concerned, there were probably no roads as such till the British efforts in that direction in the present century (Madhava Rao 1961:453). The major river of the region ie., the Wainganga is also navigable only for some time during the monsoon (Begbie and Nelson 1927:129). However, these apparently were no hindrance and communication in the pre-road era was relatively easy because of the nature of the soil (Smith 1876:12): 'although art has done next to nothing for the district, nature has given it a soil which allows of good natural roads, and every village and town is connected with its neighbour's by tracks, on which the small cart of the country, made with low solid wheels and sharp tires, easily travels for eight months out of twelve.' From Mahismati, on the age-old crossing of the Narmada river, the other axis along which Buddhist establishments and early inscriptions have been found is the western flank of the Deccan plateau. The Buddhist rock-cut caves that can be dated to the first phase of the early historic are: Pitalkhora, in the Satamala range, 68 kilometres from Aurangabad; Kondane, 33 kilometres from Lonavala; Bhaja, near the Malavi railway station, four kilometres south of the Bombay-Poona road; Nasik; and Nanaghat in the Konkan region (Mirashi 1981:237–8; Burgess 1881: 8–11; Kail 1975:77). Most of them can be dated to the early Satavahana phase, the Bhaja caves possibly being the oldest, and they often contain inscriptions in Mauryan Brahmi. The inscriptions on two of the pillars of the Pitalkhora Chaitya, recording the gifts of the pillars by two natives of Pratishthana, modern Paithan, clearly suggest the interleaving of routes of communication with extant Buddhist establishments. That early Buddhists also reached Kathiawar in the third century BC is evident from the presence of a cave temple on the eastern side of the Junagadh town (Kail 1975:53).

Although we have in the previous chapter noted a number of routes extending from Gujarat and Maharashtra to Malwa, in the light of the above-mentioned evidence, what seems to be new in the early historic period is the development of lines of movement into the Konkan region. Sopara itself, however, in contradistinction

to the literary image of this entrepot town, has not yielded any useful contemporary archaeological evidence. The Konkan region seems to give the impression of having been a nodal area in terms of trade routes. Although there are a large number of passes across the Sahayadri from Konkan (cf. Campbell reprint 1984:216), the Nanaghat pass, south of the Malsej ghat seems to have been exceedingly important: interestingly enough, 'Nana Ghat affords the shortest route between Devagiri and Aurangabad to Kalyan—Bhiwandi and Thana. . . .' (Sherwani and Joshi 1973:27). From Aurangabad, where Pratishthana and Pitalkhora were flourishing, the route went through Bhogavardhana to Ghatotkacha from where the Burhanpur gap was traversed to reach Mahismati, Ujjain, and other important central Indian sites. The cave remains at Kondana, Bhaja and later on, at Karla and Bedsa also, in the opinion of Campbell (reprint 1984), suggest that the Bor pass was a much-used route from the Konkan region towards Poona. This communication line reached Nasik where the route proceeded towards Burhanpur, and on to the Malwa plateau.

Higher up, from the Gujarat coast where early historic remains have been found in the Broach and Surat districts also, routes went across, as earlier, through the Dhulia district to the Asir-Burhanpur gap from where the Narbada at Mahismati was crossed on to Ujjaín, Vidisa, Bharhut, Tumaon and other important early historic centres of central India. That Mauryan influence extended into the Kathiawar peninsula is evident from the Asokan rock edict at Junagadh where, as noted above, a Buddhist rock-cut cave monastery has also been found. Shell artefacts at a number of sites in Malwa as well as amazonite beads at Navdatoli were manufactured from raw materials of Gujarat provenance.

The literary image of *Dakshinapatha* broadly stops somewhere along an east-west line stretching from Vidarbha to Aurangabad and the Konkan coast. While most of the elements ie., N.B.P. pottery, Buddhist stupas, early inscriptions, Asokan edicts etc. are found in the Andhra and Karnataka regions, we propose to discuss them, for reasons of convenience, in a separate sub-section.

Taxila—Rajasthan—Malwa—Deccan

Although the literary sources do not throw any light on this issue, the epigraphic and archaeological evidence seems to suggest the presence of a feeder route from Taxila through Rajasthan to Malwa. The historical event recorded in the inscription at Besnagar at Bhilsa of the Indo-Greek king Antialcidas (145–135 BC) sending an embassy, led by Heliodorus of Taxila to the Sunga king (Mitchiner volume 9, 1975:788) is evocative of such contact. The presence of Indo-Greek cultural elements in Rajasthan has already been pointed out. We have also noted above that a number of donations were made at Sanchi by natives of Pokhareya identified with the Pushkara lake.

Some Taxila-type coins have also been found at Maheshwar, although the stratigraphic context is late ie., 100 AD to 300 AD (Roy 1968:104). That communication extended right up to Andhra Pradesh along this axis is evident from the presence of lapis lazuli beads in Rairh and Nagari in Rajasthan, Nevasa in Maharashtra, Maski in Karnataka and Veerapuram in Andhra Pradesh, among other sites. Silver artefacts, found all along this axis, could have also been manufactured from Afghanistan ore.

Maharashtra—Andhra Pradesh—Karnataka—Kerala—Tamil Nadu

Lines of movement linking these regions have to be visualized at two levels. Firstly, there are a number of elements in the sites of some regions which throw specific light on the movement of north Indian cultural traits there. Secondly, there is the widespread phenomenon of megalithic burial and habitation sites spread over almost all the sub-regions from the Deccan southwards, whose archaeological repertoires and basic distribution also throw light on the directions in which the southern regions had opened out.

As regards the first level of communication, *Madhyadesha* cultural elements occur most spectacularly at Andhra Pradesh whether in the form of Buddhist stupas and art elements evocative of the north Indian style, or Asokan edicts and N.B.P. pottery. That Andhra Pradesh was extremely strategic in the administration of the Mauryan empire is clearly suggested not only by the presence of Asokan edicts in the Kurnool district (Erraguddi, Amaravati, Rajula Mandagiri) but also by the archaeological evidence at Veerapuram, in the same district, of a mint with the authority to issue Mauryan currency. N.B.P. pottery has also been found at Vaddamanu, Amaravati and Cehbrolu. Whether Asoka Maurya built the monolithic quarzite pillar or the earliest stupa, or both, at Amaravati is a matter of controversy (cf. Ray 1983:115), although

Buddhism was definitely introduced into the Krishna valley during his regime. Twenty miles north-west of Amaravati, another stupa, dated to the second half of the second century BC, was founded at Jagayyapeta. The original stupa at Bhattiprolu must also have been Mauryan. Other early Buddhist centres were probably founded at Guntupalli and Kesarapalli and the stupa site at Salihundam in the Srikakulam district.

From the Kurnool district, as the distribution of Asokan inscriptions suggests, the line of interaction went to the Raichur doab (Paligundu, Maski, Suvarnagiri) Bellary (Nittur and Udegolam) and Chitaldrug districts (Siddapur, Brahmagiri, Jatinga-Ramesvara). In fact, the punch-marked coin hoard found at Raichur suggests that north India and Karnataka were interacting in the pre-Mauryan period (Sarma 1974:54)—the pre-Mauryan coins were in the ratio of 4:1 to the Mauryan ones. There is also a definite association in ancient Indian literature between the south and precious stones and minerals. The reference in the *Arthasastra* of Kautilya has already been cited. Even in the *Ramayana*, in the Yuddha Kanda (Canto CXXVI), Rama, pointing out the Rsyamukha hill (identified with the Tungabhadra region) to Sita says 'Yonder rises the Rsyamuka mountain shining with its veins of gold ore, like a cloud with lightning playing on it'. Whether these references are to underline the importance of the south as a storehouse of significant mineral resources or whether they actually reflect the movement of such resources to north India is not completely clear. Resources like gold were easily available in significant quantities to the Gangetic plains from the Singhbhum belt, among other regions, while beryl was also available and was used in an early historic context in Rajasthan.

Although Begley (1986:305) has argued for a north-south route along the eastern coast, I.K. Sarma's analysis of the evidence or lack of it is more convincing. According to Sarma (1974:53–5), a significant connection from north India along the eastern coast to Andhra Pradesh and other regions seems unlikely in the light of the absence of N.B.P. yielding sites along the eastern coast ie., south-east of Sisupalgarh, even at well excavated sites like Salihundam. The axis of communication through which these elements were disseminated seems to have been from the Vidarbha region, along the Pauni—Deotek line, to Andhra Pradesh and to the Raichur, Bellary and Chitaldrug districts, communication which went back to the pre-Mauryan period. As Sarma (1974:55) put it: 'Asoka's "Dharmavijaya" towards *Dakshinapatha* appears to be a well-planned attempt since a favourable ground was already laid by the Buddhist monks much earlier to him. Kalinga not only changed his ideals of life but also set him back rightly to the traditional Central

Deccan route.' Although from Maharashtra there exist lines of movement through the Gulbarga, Belgaum, Bidar regions into the Raichur doab and also direct lines through the same regions into the Andhra plateau, which did possibly mediate some amount of traffic into Karnataka and Andhra Pradesh, they do not seem to have represented the arterial lines of contact—the significant elements that exemplify interregional movement whether it is the presence of the non-local raw materials, or N.B.P. pottery or Asokan edicts are not found in any of these Karnataka districts adjoining Maharashtra, the Raichur doab and Andhra. Even the Buddhist vestiges in the Gulbarga and Shimoga districts are late, datable to the early centuries A.D. (Nagaraju 1986:10).

On the second level, in the period under discussion, the widespread phenomenon of megalithism, stretching from the Vidarbha region to the remotest regions of Tamil Nadu, and from the Kanara and Kerala regions to the eastern littoral, suggests a widespread opening up and linking of various regions. To summarize, in Maharashtra, megaliths are found in the Nagpur, Wardha, Yeotmal, Chanda, Kolhapur, Ratnagiri, Khandesh and Poona districts. In Karnataka, megaliths are found in the districts of Bidar, Uttarkannada, Raichur, Bellary, Chitradurga, Dharwar, Belgaum, North Kanara, Gulbarga, Shimoga, Mysore, and Kolar. On the south-western coast, such sites are reported from Kozhikode, Kottayam, Palghat, Quilon and Coorg. On the eastern side, megaliths are reported from the Guntur, Krishna, Mahbubnagar, Prakasham, Nalgonda, Srikakulam, Bhadrachalm, Kurnool, Cuddapah, Rangareddy, Karimnagar, Warangal, Hyderabad and Adilabad districts of Andhra Pradesh. In Tamil Nadu megalithic sites are found in the Thanjavur, South Arcot, North Arcot, Chingleput, Tirunelivelli, Salem, Coimbatore and Madurai districts.

Although there are a number of structural conformities among megaliths of these different sub-regions, there are many cultural and architectural differences as well, perfectly understandable in the light of the large chronological span covered stretching from about 1200 BC till the early centuries AD. We outline below some of the general lines of movement in these regions, on the presumption that, possibly in the last centuries BC, megalithic types were found all over these regions.

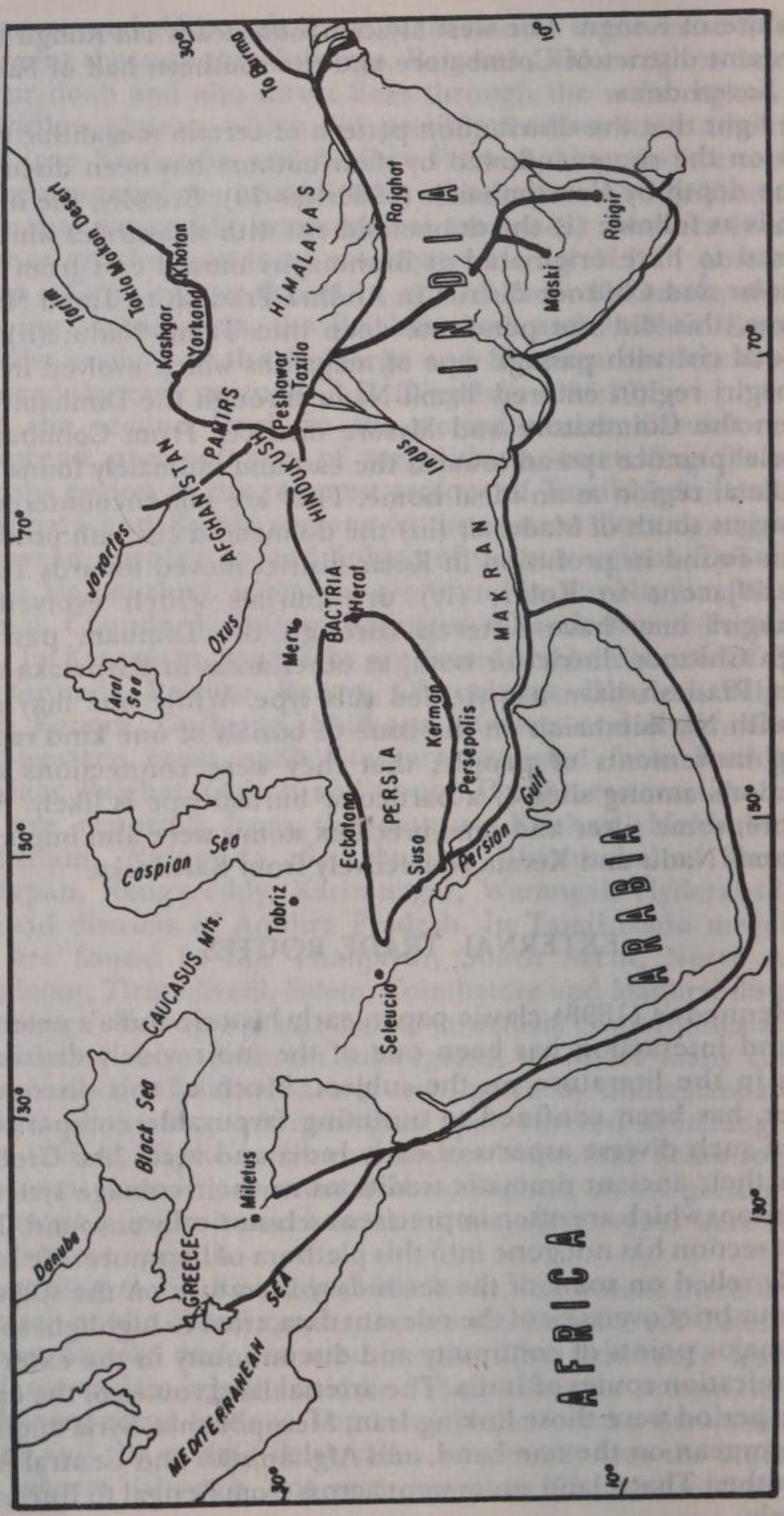
According to F.J. Richards (1924:24–5), there were three lines of approach to the Tamil country across the Deccan, *via* Cuddapah, *via* east Mysore and *via* west Mysore. The first route leads to Tondamandalam *via* the middle Palar valley; the second, ie., the east Mysore route leads to Tondamandalam *via* the Baramahal (or Salem) and the middle Palar valley, or directly into the latter, but gives access (though not very easy) to Cholamandalam *via*

Cuddalore of Kongu. The west Mysore route leads *via* Kongu (ie., the present district of Coimbatore and the southern half of Salem) to the Kaveri delta.

The light that the distribution pattern of certain megalithic types throws on the routes followed by their authors has been discussed in some depth by Narasimhaiah (1980:169–70). Broadly, the distribution is as follows: (i) the dolmenoid cist with slab-circles which is supposed to have originated at Brahmagiri moved east from District Kolar and Chittoor district in Andhra Pradesh to Tamil Nadu. However, this did not penetrate deep into Tamil Nadu; (ii) the transpetal cist with passage type of megaliths which evolved in the Brahmagiri region entered Tamil Nadu through the Dimbam pass between the Coimbatore and Mysore districts. From Coimbatore the burial practice spread towards the east and ultimately found the Pudukkotai region as an ideal home. They are not encountered in the districts south of Madurai; (iii) the dolmenoid cist with posthole which is found in profusion in Kolar district moved towards Tamil Nadu adjacent to Kolar; (iv) urn burials which evolved at Brahmagiri may have entered through the Dimbam pass or through Chittoor district or both, as other areas in Karnataka and Andhra Pradesh have not yielded this type. While one may disagree with Narasimhaiah on the issue of burials of one kind representing movements of people, that they were connections and interactions among sites of a particular buriaal type is likely. Furthermore, some silver and semi-precious stones were also imported into Tamil Nadu and Kerala respectively from Karnataka.

EXTERNAL TRADE ROUTES

Since Kennedy's (1898) classic paper, early historic India's external trade and interaction has been one of the most widely discussed themes in the literature on the subject. Much of this discourse, however, has been confined to outlining favourable comparisons between such diverse aspects of early India and areas like Greece, such as their ancient dramatic traditions or their coinage systems, comparisons which are often imprecise and historically unsound. The present section has not gone into this plethora of literature. We have basically relied on some of the secondary literature on the subject, and in our brief overview of the relevant data, tried to highlight some of the major points of continuity and discontinuity in the external communication routes of India. The arterial land routes of the early historic period were those linking Iran, Mesopotamia, Syria and the Mediterranean on the one hand, and Afghanistan and Central Asia on the other. That a land route went across from Bengal to Burma is also likely.



Map 46

EXTERNAL TRADE ROUTES IN THE CONTEXT OF THE PERIOD BETWEEN 1000 B.C. AND 200 B.C.

The rise of the Achaemenid empire in the Median heartland in western Iran in the 6th century BC and its intrusions into the borderlands to the east, including a portion of Indian territory, provides the context for the affinities between Persia and India. To briefly survey the data, comparisons have been suggested between the Persian shekels and Darics and some Indian coin types (cf. Asthana 1976:171), the use of stone in Persian and Indian art and architecture (see Asthana 1976:191ff; also see Irwin 1981:314–5), and the evolution of the Kharoshthi and the Aramaic script, among other features. Further west, relations between ancient India and Egypt, Palestine, Syria and Greece have also been suggested. In this regard, many categories of evidence have not been critically analysed. For instance, one of the most striking pieces of evidence, in Asthana's opinion (1976:167), of the export of Indian animals comes from the obelisk of Shalmanesar III (859 BC) where Indian elephants and apes are represented. Both these animals, however, could well have been of African origin. While there is etymological (Rhys Davids 1903:116; cf. Mookerjee 1912:68) and epigraphic evidence (cf. Rock Edict XIII of Asoka Maurya) to suggest contacts with Greece, the major archaeological evidence comes from Taxila (Marshall 1951): (i) the fragment of a mixing bowl, which is adorned at the base with a head of Heracles, or perhaps in the guise of Heracles, wearing a lion's skin; (ii) the presence of Hellenistic embossed or stamped ware; (iii) a bullae of red terracotta which on the convex side shows in a relief a lion killing a bull; (iv) coins of Greek kings including those of Alexander, Philip Aridacus, Diodotus, Demetrius etc.

The line going from the north-west up to Greece was mediated by Iran. Iran could have been approached through the Bolan-Quetta axis as well as along the Makran route that went along the coast. Northern Iran was also accessible from the Turkmenia—Bactria axis and from the Herat—Khyber route. As far as the first approach is concerned, although an Asokan edict has been found at Kandahar, there are no early historic remains in the Pishin-Quctta-Bolan region. It is likely, therefore, that Kandahar was approached from Herat. Although Alexander is known to have marched with a contingent through Gedrosia, there is a complete lack of early historic remains there; this route, again, seems to have been of transient political importance. That routes went from Iran through the Khyber and through Kabul (along the Swat regions) to the Indus and were major external routes of the period is suggested by the literary and archaeological evidence of the Achaemenid and Greeks having marched through them, the Asokan inscriptions of Lampaka, and the large number of early historic sites and copper hoards in the North West Frontier province.

Some of the trade with western Asia, Babylon and possibly Greece was also being mediated through Bactria. From Swat, the route/s that went across the Dir and Chitral continued to flourish along broadly the same axis that existed in the preceding neolithic-chalcolithic period. The abiding importance of north Afghanistan ie., Bactria is most palpable in the archaeological record in the form of diverse raw materials from there in the early historic sites such as lapis lazuli, silver and gold. Additionally, jade from Central Asia and China continued to be available to north-western India. The archaeological evidence from Khotan such as a round bead of red/yellow carnelian (etched) from Yotkan and a grey stone spindlewhorl (Stein 1921:117–18) is, however, probably later than the period under discussion.

That semi-precious stones from Afghanistan and Central Asia travelled through the north-west into inner India is also clear. Lapis lazuli objects, for instance, have been found in Rajasthan, Malwa, Maharashtra, Andhra Pradesh and Tamil Nadu on the one hand, and along the Gangetic plains right up till the lower Ganga estuary on the other. Russian amber also found its way to the north-west. Similarly, items of jade are found in central India and in Bengal.

As regards the maritime route from the Mediterranean to India, that ships travelled from port to port in India is suggested by a reference in the *Arthasastra* (7.12.20. Kangle [II] 1963:417): 'In the case of a waterway, however, as between a route on high sea, the route along the coast is preferable because of the large number of ports, or a river-route, because of perennial use and because the dangers in it can be withstood.' However, if we study the site distribution along the coasts in the early historic period, one cannot find any sites as such beyond Somnath pattan in Gujarat. Much importance used to be attached to Hippalus' discovery of the monsoon in the first century AD, before which, it was argued, a direct sea route was unlikely. Presently, it is being increasingly recognized that knowledge of the monsoon winds was known well before its formal discovery and therefore, direct maritime commerce between India and countries across the Arabian sea was likely. In this regard, the large number of references to sea voyages by traders and travellers in the *Jataka* tales are exceedingly important—that they are known to have carried birds that were meant to guide ships towards the land also implies that ships were often sailing through the oceans and not along routes from where lands could be seen shimmering in the distance. It is likely that south Indian commodities like sandalwood and pearls along with elements of the Tamil language reached countries in western Asia and the Mediterranean through the sites, extending from Gujarat to Kerala and in Tamil Nadu as well. At one such site, Kaveripattinam (250

BC), at the mouth of the Kaveri, a large structure which seems to have been a wharf arrangement of poles driven into the alluvial soil and sand, has been discovered (see Soundarajan 1980).

That jade came to Bengal from a different route ie., through Burma has to be considered as well—this route must have been through the north-east of the country where there are a number of geographical possibilities (cf. Chakrabarti and Lahiri 1984).

SUMMARY

Our analysis of the archaeological data bearing on the trade routes that structured interaction between different cultural zones from 1000 BC till c. 200 BC has focused on the two major grand routes of early historic India—the *Uttarapatha* and the *Dakshinapatha*. The literary image of these routes in the Buddhist and Brahmanical literature seems to have clear material correlates.

The following features of the *Uttarapatha* have been emphasized: (i) Although this route stretched from the Hindukush mountains till the mouth of the Ganges, on the basis of the archaeological and literary sources, it seems to have included a number of feeder routes and combinations—the presence of northern and southern sectors between the Indo-Gangetic divide and the Magadha Anga plains, the first following an alignment along Saharanpur—Gorakhpur—Vaisali, and the second through Meerut—Kanpur—Allahabad—Rajagriha, is one such example; (ii) Although the Ganga, Yamuna and sections of other major rivers along this axis were used for communication, in contradistinction to the neolithic-chalcolithic phase, the literary representation and the settlement data clearly suggest the evolution of the northern grand route as a land route; (iii) There are several categories of archaeological data which corroborate the literary image of this route: (a) The occurrence of N.B.P. pottery from the Swat valley through Taxila—eastern Punjab—Gangetic plains till Tamralipti on the Rupanarayan estuary; (b) The presence of specifically non-local artefacts in different sub-regions along this route such as lapis lazuli in Pandu Rajar Dhibi and Mirzapur sandstone at Taxila; (c) The distribution pattern of Asokan edicts along this route; (iv) It is on the basis of precisely these categories of data, along with the literary sources, that we can postulate three important feeder routes of *Uttarapatha* through Rajasthan, Orissa and Nepal.

Although the literary image is not as strikingly focused as the northern route, various kinds of movements along the southern grand route—*Dakshinapatha*—ie., of trade, cultures and people, are there in the epigraphic sources which have been discussed in this chapter, along with the archaeological data pertaining to its basic

nature and configuration. The major conclusions in this regard are as follows: (i) Although the Gangetic plains—Vindhyachal plateau symbiosis, involving the procurement of different kinds of raw materials from the latter, goes back to the mesolithic phase, the cultural infiltration across this barrier into Malwa and further south seems to be clearly a development of this period—the presence of deluxe N.B.P. pottery from Magadha, in different regions along this route, till the Gujarat coast is possibly the clearest archaeological evidence of this unification. The distribution of Asokan epigraphs which are found at Gujjara, Rupnath, Sanchi, Deotek and Sopara is also along this axis. (ii) The donative inscriptions at various stupa sites along this route that mention the domiciles of the donors give a human reality to this archaeological picture—donors, who were often traders and sometimes mere travellers, from Ujjain, Nasik, Bhokradan, Sopara, Pushkara, Pataliputra, Vidarbha etc. seem to have frequented this route and its Buddhist establishments over these centuries. (iii) There were two sectors from the Narmada valley onwards of the southern grand route, one going into the Vidarbha region and the other going west to the Konkan coast. Quite apart from other factors, the strategic importance of Vidarbha as the line through which the Andhra plateau and the rest of the peninsular south was approached must have been of some significance. The movement towards the western flank of the Maharashtra plateau, from Pataliputra, Sravasti, Avanti, etc. underlines its importance as the point of exit for countries to the west of the Indian subcontinent. The use made of Gujarat raw materials such as amazonite and shell in the Malwa plateau throws some light on the continuance of trade in raw materials along this axis. (iii) That administrative control of this route was considered tactical is suggested, in addition to the presence of Asokan inscription, by the creation of a secondary capital by Pusyamitra Sunga at Vidisa.

Apart from these two grand routes, there were several other important routes that traversed different sections of the subcontinent in this period. As far as the north is concerned, the Himalayas continued to be traversed along two axis, spatially distant from each other. (i) The Taxila valley—Murree hills—Baramulla axis provided access into the Kashmir valley. (ii) The U.P. Himalayas could have been approached either through Saharanpur or through Bijnor—the presence of P.G.W. and N.B.P. levels in different districts of that region clearly underlines the enhanced importance of this line of movement.

Although there is no clear archaeological evidence in this regard, the classical sources paint a vivid picture of navigation from the northern regions of the Indus along the river till the sea and further west as far as Egypt in the time of Alexander, and in fact, even

before him. The presence of marine shells of western origin in the Indo-Gangetic divide and the upper Gangetic plains is also an indicator of contact between the Sind coast and the interior.

As regards south India, the eclipse of the Maharashtra—Karnataka line of communication clearly emerges from an analysis of the relevant data. (i) Alternatively, the route that became extremely important was from the north through Vidarbha to Andhra. The distribution of Buddhist monastic establishments, Asokan edicts, N.B.P. pottery etc. at various sites in Andhra is clear evidence of such movement. (ii) Karnataka was probably approached through the Andhra plateau. (iii) The distribution of lapis lazuli along a line stretching from Rajasthan to Raigir and Maski also suggests movement from the north-west till the south. (iv) The different lines of movement within south India are best understood from the distribution of megaliths which seem to have been fairly widespread—the inclusion of the south-western coastal region for the first time within the mainstream of cultural developments in south India seems to have been a new development.

The external communication axis which seems to have been the arterial land route both in terms of procuring raw materials like silver, gold, jade, amber etc. and also in the context of the different foreign intrusions into the subcontinent from the Achaemenids onwards, was the Taxila—North Afghanistan—Iran axis. As far as the maritime routes are concerned, in addition to the opening out of the Konkan coast, the movement of traffic as far as the south-eastern coast where Kaveripattinam stood is also probable.

NOTES TO CHARTS

39. *Gufkrol*: *I.A.R.* 1981–2: 25. *Semthan*: *I.A.R.* 1980–1: 21; Gaur 1987: 328–31.
40. *Sarai Khola*: Halim 1970–1: 36; Halim 1972: 1, 24. *Taxila*: Marshall 1951: relevant sections; Young 1946: 27; Sharif 1969: 12–49.
41. *Ghaligai*: Stacul 1967: 216; Stacul 1969: 81. *Pulanr*: Stacul 1967: 225. *Lalbatai*: Stacul 1967: 231. *Shaikhan Dheri*: Dani 1965–6: 36–8, 114–28. *Noghormuri*: Stacul 1969: 93–9. *Balambat*: Dani 1967: 237–46, 273–84; Stacul 1979: 342; Stacul 1969: 99. *Aligrama*: Stacul and Tusa 1977: 202–3. *Bir-kot Ghundai*: Stacul 1978: 148. *Nazahei*: Tusa 1981: 102–4. *Charsada*: Wheeler 1962: 118–23. *Timargarha*: Dani 1967: 74–207. *Thana*: Dani 1967: 21–2. *Loebanr*: Antonini and Stacul 1972: relevant sections. *Katelai*: Antonini and Stacul 1972: relevant sections.
42. *Pirak*: Ennault and Jarrige 1973: 167; Casal 1973: pl. 12.3 (c).
43. *Aguncha Bhilwara*: *I.A.R.* 1980–1: 55. *Sunari*: *I.A.R.* 1980–1: 56. *Jodhpura*: *I.A.R.* 1972–3: 29–30. *Noh*: *I.A.R.* 1971–2: 42; 1970–1: 32; 1964–5: 35. *Nagari*: Bhandarkar 1920: 130–45. *Sambhar*: Banerjee 1965: 175. *Rairh*: Puri n.d: relevant sections. *Bairat*: Banerjee 1965: 175–6. *Ahar*: Sanakalia et al. 1969: relevant sections; Sahi 1979: 367.
44. *Singh Bhagwanpur*: *I.A.R.* 1980–1: 51. *Agroha*: *I.A.R.* 1979–80: 31. *Daulatpur*: *I.A.R.* 1968–9: 9; 1977–8: 23. *Sanghol*: *I.A.R.* 1977–8: 43; Kumar 1981: 35.

Nagar: *I.A.R.* 1976–7: 42. *Ghuram*: *I.A.R.* 1976–7: 44; Sharma and Kumar 1980: 33. *Rupar*: Sharma 1964: 48; Sharma 1981: 30–1. *Bhagwanpura*: *I.A.R.* 1975–6: 16. *Purana Qila*: *I.A.R.* 1969–70: 4; *I.A.R.* 1954–5: 13. *Sugh*: *I.A.R.* 1965–6: 35–6.

45. *Ahichchhatra*: Dikshit 1952: 34–61. *Hastinapur*: Lal 1954 and 1955: 13–17, 23–101. *Hulas*: *I.A.R.* 1978–9: 61; 1980–1: 76; 1981–2: 74. *Ayodhya*: *I.A.R.* 1979–80: 76–7; 1969–70: 41. *Pariyar*: *I.A.R.* 1978–9: 61–2. *Issopur*: *I.A.R.* 1977–8: 84. *Jajmau*: *I.A.R.* 1976–7: 54. *Jakhera*: *I.A.R.* 1974–5: 43; 1975–6: 51. *Mathura*: *I.A.R.* 1973–4: 32. *Sonkh*: hartel 1976: 79, 80, 86. *Sankisa*: Sastri 1927: 107, 110. *Sanchankot*: Shukla 1986: 35. *Bhagwantpur Godapali*: Shukla 1986: 38. *Tajpur*: Shukla 1986: 39–40. *Sravasti*: Sinha 1967: relevant sections. *Atranjikhera*: Gaur 1983: relevant sections. *Alamgirpur*: I.a.R. 1958–9: 54.
46. *Malari*: *I.A.R.* 1982–3: 95. *Thapli*: *I.A.R.* 1982–3: 103. *Ranihat*: *I.A.R.* 1978–9: 75.
47. *Taradih*: *I.A.R.* 1983–4: 12–13; 1984–5: 10–11. *Maner*: *I.A.R.* 1984–5: 12. *Manjhi*: *I.A.R.* 1967–8: 9; 1983–4: 15–16. *Champa*: *I.A.R.* 1971–2: 5; 1982–3: 15. *Chechar-Kutubpur*: *I.A.R.* 1977–8: 18. *Rajgir*: *I.A.R.* 1962–3: 6; 1961–2: 7. *Apsad*: *I.A.R.* 1973–4: 10ff. *Chirand*: *I.A.R.* 1972–3: 8; 1971–2: 6; 1964–5: 7; *Panr*. *I.A.R.* 1972–3: 8. *Sonpur* : *I.A.R.* 1970–1: 6; 1961–2: 4–5; 1956–7: 19. *Balrajgarh*: *I.A.R.* 1972–3: 7. *Buxar*. *I.A.R.* 1963–4: 8. *Masaon*: *I.A.R.* 1964–5: 42; 1965–6: 51. *Ganwaria*: *I.A.R.* 1961–2: 103; Srivastava 1986: relevant sections. *Rajghat*: Narain and Roy 1977: 21, 51. *Prahladpur*: Narain and Roy 1968: 47, 62–4. *Vaisali*: Sinha and Roy 1969: relevant sections; Deva and Mishra 1961:59–66. *Kumrahar*: Altekar and Misraa 1959: 89, 141. *Oriup*: Prasad 1987: 111. *Narhan*: *I.A.R.* 1984–5: 90–1. *Kheradih*: *I.A.R.* 1983–4: 86; 1982–3: 93; 1981–2: 68. *Sohagaura*: *I.A.R.* 1974–5: 47. *Takiaper*: *I.A.R.* 1971–2: 49. *Diha*: *I.A.R.* 1969–70: 38. *Deoria*: *I.A.R.* 1969–70: 62. *Lauriya Nandangarh*: Dikshit 1940: 50; Majumdar 1938: 57–66. *Bhita*: Marshall 1915: 62, 85–92. *Sarai Mohana*: *I.A.R.* 1967–8: 49. *Piprahwa*: Srivastava 1986: 8–9. *Kausambi*: Sharma 1969: relevant sections.
48. *Munhai*: *I.A.R.* 1980–1: 38–9. *Jaderua*: *I.A.R.* 1971–2: 29. *Koldihwa*: *I.A.R.* 1973–4: 27.
49. *Dihar*: *I.A.R.* 1984–5: 95. *Pandu Rajar Dhibi*: *I.A.R.* 1984–5: 97. *Bharatpur*: *I.A.R.* 1974–5: 51. *Chandraketugarh*: *I.A.R.* 1966–7: 48; 1965–6: 59. 1959–60: 51; 1957–8: 51. *Mahisdal*: *I.A.R.* 1963–4: 60. *Bahiri*: Chakrabarti and Hasan 1982: 119, 122–3. *Bangarh*: Goswami 1948–13–17, 31–2.
50. *Jaugada*: I.A.R. 1956–7: 30. *Asurgarh*: *I.A.R.* 1972–3: 27. *Manmuda Asurgarh*: *I.A.R.* 1984–5: 59.
51. *Bilawali*: *I.A.R.* 1962–3: 10. *Garh-Kalika*: *I.A.R.* 1957–8: 34–5; 1956–7: 24; *Tripuri*: Dikshit 1955: relevant sections. *Maheshwar*: Sankalia et al. 1958; relevant sections. *Navdatoli*: Sankalia et al. relevant sections. *Awra*: Trivedi 1962: relevant sections. *Kayatha*: Ansari and Dhavalikar 1975: relevant sections. *Putli Karar*: Jocobsen 1975: 88. *Atud Khas*: *I.A.R.* 1984–5: 45. *Gilaulikhera*: *I.A.R.* 1983–4: 52. *Dangwada*: *I.A.R.* 1982–3: 59; 1979–80: 55. *Nandaur*: Sharma and Ali 1980: 87–8. *Runija*: *I.A.R.* 1980–1: 39. *Besnagar*: *I.A.R.* 1975–6: 30; 1963–4: 17. *Tumaun*: *I.A.R.* 1972–3: 16. *Eran*: *I.A.R.* 1963–4: 16; 1962–3: 11; 1960–1: 18. *Nagda*: Banerjee 1986: relevant sections.
52. *Timbarva*: Mehta 1955: 25, 27. *Somnath*: *I.A.R.* 1956–7: 17; Nanavati et al. 1971: 71, 75, 77. *Kamrej*: *I.A.R.* 1958–9: 7. *Jokha*: Mehta et al. 1971: 15, 17, 55. *Nagal*: *I.A.R.* 1961–2: 11. *Dhatva*: Mehta and Choudhury 1975: relevant sections. *Nagara*: Mehta 1968: relevant sections. *Dwarka*: Ansari and Mate 1966: relevant sections.
53. *Rajpur*: *I.A.R.* 1984–5: 53–4. *Bhagnimohari*: *I.A.R.* 1983–4: 57–8. *Khairwada*: *I.A.R.* 1981–2: 54. *Boregaon*: *I.A.R.* 1980–1: 40. *Junapani*: *I.A.R.* 1961–2: 32–4. *Ter*: *I.A.R.* 1957–8: 23; Chapekar 1969: relevant sections. *Khapa*: Deo 1970: 42, 45–53. *Teklaghat*: Deo 1970: 43, 45–51. *Gangpur*: Deo 1970: 44–51. *Bhokradan*: Deo 1974: relevant sections. *Pauni*: Deo and Joshi 1972: 31, 32, 82–5. *Pitalkhora*: *I.A.R.* 1957–8: 65–6. *Kaundinyapura*: Dikshit 1968: relevant sec-

tions. *Naikund*: Deo and Jamkhedkar 1982: 33–9. *Nevasa*: Sankalia et al. 1960: relevant sections. *Mahurjhari*: Deo 1973: relevant sections. *Paunar*: Deo and Dhavalikar 1968: relevant sections.

54. *Komaranahalli*: *I.A.R.* 1980–1: 29. *Tadakanahalli*: *I.A.R.* 1978–9: 45–6. *Hunnur*: *I.A.R.* 1968–9: 21. *Halingali*: *I.A.R.* 1965–6: 34. *Hallur*: Nagaraja Rao 1971: 77–82. 91, 92. *Brahmagiri*: Wheeler 1947–8: relevant sections. *Someshvara Hill*: Sundara 1975: 126. *Gajendragad Hill*: Sundara 1975: 127. *Piklihal*: Allchin 1960: 107, 109. *Rajankolur*: Sundara 1975: 111. *Jewargi*: Sundara 1975: 115–18. *Maski*: Thapar 1957; 103–19. *Tallur*: Sundara 1975: 131.
55. *Banahalli*: *I.A.R.* 1983–4: 44–5. *Kendatti*: *I.A.R.* 1967–8: 39. *Jadigera*: *I.A.R.* 1956–7: 34–5. *T. Narasipur*: Seshadri 1971: 66–70. *Moribetta*: Subbaya 1978: 73–4. *Savandurga*: Leshnik 1974: 100. *Ittegebail*: Leshnik 1974: 100, 103. *Aneguttahalli*: Leshnik 1974: 104.
56. *Machad*: *I.A.R.* 1974–5: 21. *Punkunnam*: *I.A.R.* 1966–7: 66. *Chengamenad*: *I.A.R.* 1963–4: 13. *Porkalam*: Thapar 1952: 6. *Chataperamba*: Leshnik 1974: 75. *Kaltakampal*: Leshnik 1974: 84. *Virajpett*: Leshnik 1974: 90.
57. *Hazurnagar*: *I.A.R.* 1983–4: 5. *Pagidigutta*: *I.A.R.* 1978–9: 65. *Uppalapadu*: *I.A.R.* 1978–9: 65. *Peddamarur*: *I.A.R.* 1977–8: 12. *Polakonda*: *I.A.R.* 1975–6: 5. *Kadambapur*: *I.A.R.* 1974–5: 3. *Vemuluru*: *I.A.R.* 1983–4: 9. *Gudimallam*: *I.A.R.* 1973–4: 2. *Hashmatpet*: Nigam 1971: 14; *I.A.R.* 1970–1: 2. *Peddabankur*: *I.A.R.* 1968–9: 2. *Pochampad*: *I.A.R.* 1964–5: 1; 1966–7: 1. *Mallepadu*: *I.A.R.* 1966–7:2. *Kesarapalli*: *I.A.R.* 1961–2: 2. *Vaddamanu*: *I.A.R.* 1982–3: 2. *Satanikota*: Ghosh 1986: 74, 76. *Ramapuram*: *I.A.R.* 1982–3: 5–6; 1981–2: 6, 8; 1980–1: 7. *Yelesvaram*: Khan 1963: 37, 54. *Chinnamarur*: *I.A.R.* 1978–9: 65. *Veerapuram*: Sastri et al. 1984: relevant sections. *Nagarjunakonda*: Subrahmanyam 1975: relevant sections. *Sankhavaram*: Leshnik 1974: 120. *Polechetti Cherugudda*: Leshnik 1974: 123–5. *Dornakul*: Leshnik 1974: 125. *Janampett*: Leshnik 1974: 126. *Rowenpalli*: Leshnik 1974: 126. *Raigir*: Leshnik 1974: 128.
58. *Kambarmedu*: *I.A.R.* 1982–3: 72. *T. Kallupatti*: *I.A.R.* 1976–7: 47; 1979–80: 69. *Alagrai*: *I.A.R.* 1963–4: 20; *Madras University Archaeological Series No.* 1970: 63, 108. *Kunnattur*: *I.A.R.* 1957–8: 37; 1955–6: 23. *Adichanallur*: Ramachandran 1980: 50–65. *Tirukkampaliyur*: *Madras University Archaeological Series* 1970: 11–15, 52–3. *Kanchipuram*: *I.A.R.* 1974–5: 38. *Paiyampalli*: *I.A.R.* 1967–8: 28. *Appukallu*: *I.A.R.* 1976–7: 47. *Mottur*: *I.A.R.* 1978–9: 72. *Odugattur*: Leshnik 1974: 40. *Panduvaram Dewal*: Leshnik 1974: 42. *Suttukeni*: Leshnik 1974: 43. *Gaurimedu*: Leshnik 1974: 44. *Perambir*: Leshnik 1974: 47. *Sanur*: Leshnik 1974: 53. *Sultan's Battery*: Leshnik 1974: 75. *Salur*: Leshnik 1974: 94. *Natkal Palliayam*: Leshnik 1974: 94, 96. *Paiyampalli*: Leshnik 1974: 39–40; Ramachandran 1980: 44.

6

Conclusion

The total picture that has emerged in the foregoing survey of the major and minor trade routes or routes of communication, and their fluctuating destinies, may now be recapitulated. Briefly, our inferences are based on three kinds of data: (i) the presence of different raw materials in the form of artefacts and in an unfinished state at different sites; (ii) the sources of these raw materials both within and outside the spatial limits of different sub-regions; and (iii) the ceramic affinities and other artefactual linkages among different sub-regions. These variables have been enumerated for the subcontinent as a whole and, in our opinion, make it possible to analyse different lines of movement from the beginning of food production in India till the second century BC. We have focused on these aspects also because some of them, especially the procurement and distribution of widely dispersed raw materials, have been most neglected in studies of the internal trade and trade routes of early India.

On the basis of the archaeological data two types of routes can be reconstructed on the different lines of movement from the seventh millennium BC till the second century BC. The first is the extensive trans-regional axis which cut across far-flung and disparate sub-regions transmitting elements of culture and commerce along its circuit. Less extensive, but more ancient and abiding, were the several arterial lines which, on the other hand, interconnected mostly neighbouring sub-regions, and occasionally relatively distant points as well.

If we begin at c. 200 BC, the first phase of the early historic period, which is also the terminal point of the present work, the literary sources clearly carry the image of two trans-territorial trade routes, one the *Uttarapatha*, striking across northern India from the Khyber till the Rupanarayan estuary, and the other, the *Dakshinapatha*, traversing the Vindhyas and the fertile Malwa plateau to reach Vidarbha on the east and Sopara on the west. If the testimony of Panini and the Buddhist literature is anything to go by, these two grand routes can be said to have evolved by the 6th-5th centuries BC.

The main themes around which the northern grand route has been analysed may be summarized. It is simplistic to visualize the *Uttarapatha* as a unified and straight line of movement from point to point. On the contrary, the data of the historical period suggest a multiplicity of possible movements along a broad directional line oriented west to east. For instance, one could move from Taxila to Delhi in a number of ways including the straight modern line through Lahore. The point is that the multiple feeder routes were often intertwined with the major axis. As far as the *Uttarapatha* is concerned, we have mentioned these feeder routes in chapter 5. That the term *Uttarapatha* had the connotation of a land route is also noteworthy, although merchants and princes in the *Jataka* literature are known to have sailed from Kausambi to the eastern seas. Classical and Indian literary sources noted along this axis the trading and exchange of diverse kinds of goods and the consolidation of political ties involving events as disparate as the encounter between Seleucus and Chandragupta Maurya, on the one hand, and the matrimonial alliance between the houses of Gandhara and Hastinapur on the other. There are also a number of recorded instances of students wandering in search of education to Taxila. The archaeological dimensions are manifest in the evidence of artefacts and raw materials travelling both ways: the Chunar and Mathura varieties of sandstone at Taxila and lapis lazuli in the Gangetic plains; the occurrence of the N.B.P. ware from Bengal till Udegrama in the Swat; and other non-local artefacts in sub-regions along this axis, such as Indo-Greek coins in the Punjab and Gangetic plains and Mauryan currency in the Peshawar highlands.

The role of *Dakshinapatha* is also of no less importance in the early historic period. The *Arthasastra* unhesitatingly accords it pride of place as the carrier of precious gems, metals, pearls etc. to Kausambi, Benares and Pataliputra. The depiction of *Dakshinapatha* as a vehicle of cultural symbiosis involving the Gangetic plains and central India is a recurring motif in the Brahmanical and Buddhist literary traditions as well. The political implications of this route are most strikingly highlighted in the creation of a second capital at Vidisa under Pusyamitra Sunga although, even in the period of the sixteen mahajanapadas, the emissaries of the kings of Benares and Pataliputra travelled to Broach and Avanti respectively. The archaeological data of the early historic period also underline the vital importance of this corridor in catering to the needs of the minerally poor Gangetic valley urban centres; iron ore, copper, sandstone, and semi-precious stones were definitely procured from the Vindhyan belt. Along with the movement of materials, cultural elements also interacted, as is clear from the presence of N.B.P. pottery along the sites on this axis. The diversity of traffic from

different domiciles along the *Dakshinapatha* is perhaps most evident from the variegated list of donors at Sanchi and Bharhut.

The conclusion then, from these various strands of data, is undoubtedly that the literary image of the *Uttarapatha* and *Dakshinapatha* is broadly validated by the archaeological and epigraphic sources of the period. However, if we go back in time, one can validity argue that these two grand routes of early historic India intermeshed more ancient lines of movement where communication had been taking place for centuries prior to literate history.

Along the Taxila valley-Punjab plains sector of the *Uttarapatha*, for instance, the presence of lapis lazuli in significant quantities at Banawali and Dher Majra suggests organized raw material procurement in the Harappan period itself. The Punjab plains—Gangetic divide line became highly significant in the late Harappan period; the large number of sites in Amritsar-Jullunder-Saharanpur on the one hand and Ambala-Karnal-Meerut on the other, clearly anticipate the two sectors of the northern grand route. Along this axis, late Harappan ceramic traits percolated as far as Ahichchhatra in Bareilly, and a finished commodity of Harappan origin ie., etched carnelian beads, reached Atranjikhera. The continuance of the same pattern of movement is underlined by the geographical spread of the ochre-coloured pottery horizon, whose spatial distribution along with that of the copper hoards, suggests lines of movement from Saharanpur—Muzaffarnagar—Bulandshahr—Bijnor—Bareilly—Budaun and through Meerut—Aligarh—Mathura—Mainpuri—Kanpur. The beginning of the first millennium BC saw a further amplification of this route, most strikingly evident in the distribution of the Painted Grey Ware settlements from the Bahawalpur tract through most of the Indo-Gangetic divide and in a number of districts in the upper Gangetic plains. The protohistoric evolution of the eastern segment of the grand route is to be seen in the flourishing black-and-red ware horizon extending from the middle Gangetic plains till the lower Gangetic delta.

At the same time the *Uttarapatha* was something more than the continuation of the trends laid down in the previous centurics. Among the important new developments along this line of movement in the early historic period was the deepening of the first leg of the route ie., from the Potwar plateau to the Punjab. The distribution of Indo-Greek coins and tribal coins of Indo-Greek inspiration along the Beas valley, the Kangra region and eastern Punjab is the clearest historical evidence of this expansion. Also contemporary is the movement of classic Gangetic plains artefacts, North Black Polished ware and Mauryan currency being two such elements, into the north-western sector of the route. Although one

encounters well-developed cultural horizons in the Gangetic plains in the form of the neolithic cord impressed pottery and the subsequent black-and red-ware horizon, none of these neolithic-chalcolithic elements were disseminated across the Indo-Gangetic divide and into the north-west. The N.B.P. culture is the first ceramic horizon that united the whole stretch of the subcontinent from the Hazara borderlands to the Bay of Bengal. Another element which also seems to have been relatively speaking, a more recent growth was the route along which Buddhism reached Nepal, going from both Kapilavastu and Vaisali to Lumbinigrama. And then, there is the important feeder route of *Uttarapatha* going across to the Orissa littoral where, along with the literary references, middle Gangetic raw materials, N.B.P. pottery and other cultural elements provide striking testimony of that region's involvement with the Gangetic plains.

Dakshinapatha's evolution also manifests a similar amalgamation of earlier elements with new trends that become specifically dominant in the early historical period. There were movements of hunter-gatherers from central India into the middle Gangetic plains as early as the Stone Age context. The present work has also highlighted the close relationship between the Son and Belan valleys covering a portion of the eastern Vindhyas and different segments of the middle and upper Gangetic plains from the proto-neolithic onwards. This relationship involved the presence of common cultural traits such as neolithic cord impressed ware, on the one hand, and the exploitation of Vindhyan cryptocrystalline stones, most significantly chalcedony, and copper by the Uttar Pradesh and Bihar cultural complexes, on the other.

From the very beginning of food production in the Malwa, Maharashtra and Gujarat regions, neolithic-chalcolithic cultures along the central India—Narmada and Tapti valleys—coastal Gujarat line were oriented towards, and interacting with, each other. The movement of Kayatha ware into the central Tapti basin foreshadowed the subsequent more tightly knit movement of Malwa wares into Maharashtra and Gujarat. The bidirectionality of movement along this axis is evident from the presence of Lustrous Red ware and other late/post Harappan elements, as well as marine gastropoda from coastal Gujarat, into Maharashtra and Malwa up to the Chambal ravines. Although Maharashtra began to look towards the south from the Jorwe phase onwards, the rendering of Jorwe type painted designs at Pipliya Lorka in the Raisen district suggests that the route between Maharashtra and Vidisha was not completely abandoned. The Malwa and Jorwe cultural levels at Tuljapur Garhi in Amraoti district in Maharashtra meant that the

Narmada-Vidarbha sector of the grand southern route had chalcolithic antecedents as well.

These elements certainly furnished the foundations on which the *Dakshinapatha* of early historic tradition was created and consolidated. This great southern route, however, in certain respects went significantly beyond some of the spatial limits of these earlier interactions. For the first time, for instance, in the early historic period, one encounters the integration of the vast, sprawling and culturally diverse zones stretching from Rajagriha in the east to Sopara on the west. While the Vindhyan highlands and the Gangetic flood plain were involved in a generalized interaction from the Stone Age itself, it is only with the movement of the Painted grey ware pottery that a Gangetic valley cultural element crossed the Vindhyan barrier to reach Ujjain. The subsequent North Black Polished ware horizon, along with Buddhist stupas and monastic establishments, truly subcontinentalized the southern grand route. In fact, the rich texture of the historical realities of merchants, craftsmen, travellers and missionaries interwoven in the inscriptions found along this route, gives a qualitatively new dimension to the preceding, relatively inchoate, elements of trade and commerce present along this axis. These organized, 'profit making' movements may have a causal relationship with the increased needs of the large urban centres of the Gangetic plains for a plethora of raw materials including iron ore, from central India. This was also the intermediary zone which had to be traversed in order to move into the western littoral from where ships sailed to Mesopotamia and Greece. Another important line that was elaborated and deepened was the Narmada—Vidarbha arm of the grand southern route whose importance, as the trade route going into Andhra Pradesh and other southern regions, is evident from the large Buddhistic sites and other early historic complexes, often containing N.B.P. What was also strikingly different was the penetration of the Sahayadris or the Western Ghats to reach Sopara, one of the prosperous entrepots of its time on the northern Konkan coast.

If we shift our emphasis from the history of these two major grand routes to that of the less extensive, but perhaps equally important, inter-regional routes, some of which became significant in the fourth millennium BC itself, the overall picture is far more complex. Different economic and social conjunctures coalesced at different points in time to create a shifting picture of interaction of routes and movements, with some trade routes remaining broadly significant throughout the protohistoric and early historic periods, while others enjoyed dramatically unstable fortunes.

The earliest protohistoric lines of movement, developed in the period antecedent to the Harappan civilization, were primarily

confined to the north-western part of the Indian subcontinent, mediating traffic among the provinces of Baluchistan, Sind, the Punjab and Bahawalpur plains, extending into the eastern Punjab zone from the Kot Dijian phase onwards. Within this spatial framework, the arterial trade routes that developed were as follows; (1) a 'Kot Dijian' axis along the Quetta—Zhob—Derajat—Upper Sind—Ghaggar/Hakra system, with feeder routes going to the Bannu basin and the Potwar plateau; (2) a route or routes from central and south Baluchistan to Sind Kohistan and the southern Sind plain; (3) a broadly vertical axis from south to north Baluchistan which, from the beginning of the Kulli phase, turned towards the Kach Gandava plain and the Bolan plateau for mediating interaction with the north; and (4) the Sind-Cholistan route oriented towards Punjab and Haryana on the one hand and Rajasthan on the other.

The Harappan urban phenomenon, while flourishing broadly along the same geographical spread (with a major extension into Gujarat) organized its trade routes and procurement along slightly different lines. While the 'Kot Dijian' axis still funnelled Harappan traits into north Baluchistan and raw materials from there and the Derajat region into the Punjab plains and upper Sind, it was not the crucial route between Sind and Baluchistan. It was south Baluchistan which became more significant during this period, presumably because of the Harappan need for south Baluchi raw materials such as copper, lead, *silajit*, haematite, semi-precious stones and so on. It was along the coastal strip to the west of the Kulli cultural zone that Harappan outposts like Sotka Koh and Sutkagen Dor were situated. It is evident from the distribution of the Harappan sites that the Indus river became an important artery of communication from the Sonmiani bay up to its ascent into the upper Indus plains. Towards the east, foremost among all the routes was the corridor though the Cholistan tract of Bahawalpur that mediated traffic from Sind towards Punjab and Haryana in the east or towards Rajasthan in the south. Although in the pre-Harappan period itself, shell from Sind was carried along this line to eastern Punjab, it was during this period that a uniform cultural horizon ie., the Harappan, came to dominate the entire region. The commercial and cultural importance of the Rajasthan sector of the route also became strikingly highlighted and this was a relationship of special privilege on account of the latter's enormous mineral resources, especially copper. Rajasthan also provided semi-precious stones and at least one precious stone ie., emerald to the Punjab and Haryana regions along at least three different axis ie., the Hissar—Bhatinda—Sangrur—Ludhiana—Rupar line, the Kantli—Drishadvati—Nohar line, and the Dohan river from Baleshwar

right till Haryana. The other region with which the Harappan civilization seems to have been intimately involved was the North West Frontier province, and the Swat neolithic-chalcolithic pockets there. The primary significance of this route lay in its role as the main channel through which the monumental centres of the Harappan culture in Punjab, and possibly Sind, came to procure resources such as jade, lapis lazuli, silver, gold, copper and semi-precious stones from Central Asia, Afghanistan, and the North West Frontier province itself. It remains to be mentioned that a trade route from Gujarat and Sind was also among the more significant routes—a route along which some amount of human migration from the latter region may have taken place. That this was a land route going through Kot Kori and the Rann of Cutch is highly probable, although there was some maritime traffic from Gujarat, hugging the coast, up to Sutkagen Dor on the Makran.

The decline of the Harappan civilization signified the lapse of a number of these routes into relative obscurity. The trade routes along Sind—Baluchistan and the central and upper Indus plains—Potwar plateau were among these. The role of the *rohi* tract of Bahawalpur was also not as important as it had been in the preceding centuries—the number of Cemetery H culture sites,, which are quantitatively far less than those of the mature Harappan phase, seem to mark the beginning of the archaeological and historical twilight in which it came to be consequently shrouded. However, the declining Harappan urban phenomenon did not concern the whole compass of north-west India and Gujarat; many other lines of movement were flourishing, their prosperous condition in studied contrast to the collapsing Indus urban culture. In the Indo-Gangetic divide, for instance, there appeared for the first time a major route which foreshadowed the first leg of the famous northern grand trunk route of history along Chandigarh—Ambala—Karnal—Panipat—Meerut. The two important feeder routes from the Indo-Gangetic divide moved, on the one hand, to Saharanpur and Muzaffarnagar and, on the other, through Hissar—Jind—Rohtak into Gurgaon and Pataudi. From the late Harappan phase also, the maritime route in Gujarat completely opened out; the presence of numerous late/post Harappan settlements along the Gujarat coast is proof enough of this.

The other neolithic-chalcolithic horizons, some of which were contemporary with the Harappan urban phase, continuing up to the beginning of the 1st millennium BC take us into regions removed from the Harappan distribution area. If the Harappan phenomenon with its overarching socio-political authority united large sections of north-western India in a web of important lines of communication, the less spectacular neolithic-chalcolithic cultural

pockets, spread over large parts of the subcontinent from Kashmir till Tamil Nadu, also opened out the main and secondary arteries in inner India ie., across the Delhi—Aravalli Cambay divide. Segments of these communication lines have already been highlighted in the foregoing analysis of *Uttarapatha* and *Dakshinapatha*, but there were many other routes that do not form a part of those larger movements. Towards the north, the Swat neolithic through Muzaffarabad, and along the right bank of the Jhelum to Baramulla, mingled with the contemporary neolithic culture of Kashmir spread along the valley till Burzahom, on the one hand, and Pampur on the other. Whatever limited pre-Harappan and Harappan affinities existed in Kashmir in that period reached there through this route. The notable connections between another northern mountainous region, the Uttar Pradesh Himalayas, and the Gangetic plains skirting this belt, also developed in this phase. In general, the O.C.P. and copper hoard sites of Saharanpur, Bijnor, Shahjahanpur, Hardoi and so on obtained varieties of stone and copper from the Siwaliks and the Himalayas through routes that went across through Dehradun, Hardwar and Bijnor. If we turn to western India, the late/post Harappan period provides the context in which the chalcolithic Aharian culture of the Berach and Banas basin and the Gujarat region, till the coast, confronted each other—lapis lazuli, etched carnelian beads, marine shells and Lustrous Red ware formed part of the traffic along the routes which went from Dungarpur and through the Malwa plateau. A number of sites situated along the routes from Rajasthan to Malwa also contain Ahar fabrics in their artefactual repertoires; Ujjain, Shajapur and Mandasor districts are particularly significant from this point of view. The alignments along southern India were of no less importance in the scheme of trade routes being evolved in this period. The presence of Savalda ware in Karnataka clearly shows that the route of movement from Maharashtra into Karnataka had a very early beginning, flourishing most significantly in the Jorwe phase when the diffusion of that culture's traits through the northern *maidan* region went as far as T. Narasipur on the southern plateau. That south Karnataka mediated neolithic traits into Tamil Nadu and vice versa is also likely. The movement of cultural traits from neolithic Karnataka across the Sahayadris to the Kanara districts is evident from the neolithic wares of Maski fabric there and the presence of marine products in sites like Tekkalakota, Hallur etc. On the east, it was the Srisailam hills that provided access from the Andhra plateau, where shell artefacts are found at sites in the Guntur, Kurnool and Mahbubnagar districts, to the coast.

The transition of large segments of the subcontinent into early history, and the second urban phase, saw the efflorescence of the

two major trans-regional trade routes ie., the southern and the northern grand routes, alignments that have already been discussed. In addition, there were several other routes which continued to flourish in a pattern corresponding to the preceding neolithic-chalcolithic cultural phase. The continuance of the northwestern route to Kashmir is clear from the N.B.P. related ceramic horizon and the Indo-Greek coins in the latter region. The major modification in its orientation was its swing through the Murree hills to Taxila, and not westwards into the Swat region, as earlier. Similarly, the striking Gangetic plains affinities, in the form of P.G.W. and N.B.P. horizons, in the early historic sites of the Uttar Pradesh Himalayas are suggestive of the deepening of the communication lines between the two sub-regions, the procurement of an increasing plethora of raw materials from the hills still being a dominant element in this relationship. Also in use was the route from Rajasthan to Malwa along which, in addition to the inhabitants of the Pushkara lake who left behind a large number of inscriptions at Sanchi, the embassy of Heliodorus reached Vidisa. Heliodorus, of course, came from Taxila, from where coins also emanated into the Malwa plateau. That the Taxila—Rajasthan—Malwa axis was the line along which lapis lazuli reached central India, Maharashtra, Karnataka and the Andhra plateau is also most probable. Early historic sites which show lapis along this axis are Taxila, Rairh, Nagari, Nevasa, Kaundinyapura, Veerapuram, Raigir and Maski. In the south, although the major sub-regions continued to interact with each other, there were clearly significant modifications in the lines along which these zones intermingled. The Karnataka—Maharashtra line on the south-west was eclipsed by the arterial trade route, disseminating N.B.P. and related cultural elements as well as Buddhism, from the Vidarbha region into Andhra Pradesh. From the Raichur doab, the Bellary and Chitradurga districts were approached. The distribution of megalithic sites also suggests the directions in which the southern megalithic distribution area had opened out; important routes existed between south Karnataka and Tamil Nadu, as well as with Kerala and the south-western littoral.

In addition to the modifications mentioned above, there were some other remarkable discontinuities from the protohistoric till the early historic period. Among the most striking changes was the fate of the Sind—Gujarat and Baluchistan—Sind—Cholistan lines. Whereas till the Harappan period, these were very significant lines, they were completely eclipsed by the early historic phase. Alexander's historians notwithstanding, in the early historic period, archaeologically, Baluchistan and Sind present a singularly unimpressive scenario.

The pattern of external trade routes may also be briefly summarized. From neolithic Mehrgarh onwards right up till the early historical period, the north-west India—Central Asia trade route seems to have been the most abiding line of external communication. The Iranian connection, through the Bolan route as well as through Bactria was also remarkably stable. The Mesopotamian—Indian contacts are most sharp in the Harappan period; the early historic picture suggested by literary sources is not archaeologically validated at any significant level. Towards the north-east, a connection with Burma and possibly China has to be considered.

The archaeology of Indian trade routes, then, has a few historical and methodological implications for studies on trade and trade routes of ancient India. On the one hand, the strands that developed in the several centuries prior to the beginning of history show that any notion of a sudden and spectacular outburst of commerce and communication in the early historical period, exemplified in the two trans-regional trade routes, is not appropriate for understanding the evolution of such routes. On the other hand, there were significant shifts as well, shifts which involved the complete decay of what had been trade routes of considerable import, and which are to be explained in the context of historical developments in those regions. The documentation of the raw materials, used by the ancient cultures and available to different sub-regions within and outside their spatial limits, has possibly underlined the efficacy of this approach for studying the issue of trade routes from the archaeological standpoint. The structure or structures in which such resource procurement was undertaken requires a very detailed knowledge of the ethnographical and ethnohistorical ways in which different sub-regions have been exchanging and using resources not available within their ambits, but that is a problem which is beyond the scope of the present study.

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Glossary

Rajagriha	**Rājagriha**
Pratishthana	**Pratiṣṭhāna**
Uttarapatha	**Uttarāpatha**
Dakshinapatha	**Dakshināpatha**
Mahajanapadas	**Mahājanapadas**
Rajatarangini	**Rājataraṅgiṇi**
Malavas	**Mālavas**
Anguttara Nikaya	**Aṅguttāra Nikāya**
Mahabhashya	**Mahābhāshya**
Sunga	**Śuṅga**
Bala Kanda	**Bāla Kāṇḍa**
Ramayana	**Rāmāyaṇa**
Vishvamitra	**Viśvamitra**
Bharatayuddha-Katha	**Bhāratayuddha-Kathā**
Mahabharata	**Mahābhārata**
Madhyadesha	**Madhyadeśa**
Aditi	**Aditi**
Shri	**Shrī**
Yadavas	**Yādavas**
Ghata Jataka	**Ghāta Jātaka**
Sravasti	**Śrāvastī**
Mahavamsa	**Mahavaṃsa**
Ayodhya	**Ayọdhyā**
Kosala	**Kośala**
Pariyar	**Pariyār**
Pandavas	**Pāṇḍavas**
Sringaverapura	**Śringaverapura**
Rama	**Rāma**

Sita	Sīta
Chitrakuta	Chirakūṭa
Kausambi	Kauśāmbi
Bharadvaja	Bhāradvāja
Ghastirama	Ghastirāma
Prayaga	Prayāga
Kapilavastu	Kapilāvastu
Magadha-Anga	Magadha-Anga
Vaisali	Vaiśalī
Pataliputra	Pāṭaliputra
Champa	Champā
Mahasthangarh	Mahāsthāngarh
Mahamatra	Mahāmātra
Kumara	Kumāra
Tosali	Tosalī
Ujjayini	Ujjayinī
Mahismati	Māhiṣmatī
Vidisa	Vidiśā
Pusyamitra Sunga	Puṣyamitra Śunga
Kalidasa	Kālidāsa
Malavikagnimitra	Mālavikāgnimitra
Kaundinyapura	Kauṇḍinyapura
Isila	Iśilā
Dhammapadatthakattha	Dhammapadaṭṭhakatthā
Amaravati	Amarāvati
Panini	Pāṇini
Asthadyayi	Aṣṭhadyāyī
Bahudhanyaka	Bahudhānyaka
Sairshaka	Śairshaka
Rohtika	Rohtika
Ayodhya Kanda	Ayodhyā Kāṇḍa
Vasishta	Vaśishta
Pralamba	Prālamba
Bahlika	Bāhlika
Jatakas	Jātakas

Sarthavaha	Sārthavāha
Bannupatha-Jataka	Bannupatha Jātaka
Ummadanti Jataka	Ummādanti Jātaka
Takkasila	Takkasilā
Jivakumarabhrtiya	Jīvakumarabhṛtiya
Haimvatamarga	Haimvatamārga
Arthasastra	Arthasāstra
Vanija Jataka	Vaṇija Jātaka
Mahajanaka Jataka	Mahājanaka Jātaka
Suvarnabhumi	Suvarṇabhūmi
Sabha	Sabhā
Krishna	Krishṇa
Bhima	Bhíma
Siddhasrama	Siddhāsrama
Jahnavi	Jahāṇvi
Mithila	Mithilā
Tamasa	Tamasā
navya	nāvya
nava-tittha	nāva-tittha
Divyavadana	Divyavadāna
Ajatasatru	Ajātasatru
Kautilya	Kauṭilya
Mahaparinibbana Suttanta	Mahāparinibbāna Suttānta
Digha Nikaya	Dīgha Nikāya
Amabalatthika	Amabālatthika
Nalanda	Nālandā
Pataligama	Pāṭaligāma
Kotigama	Koṭigāma
Capalya	Capālya
Pava	Pāva
Bhandgama	Bhandagāma
Hatthigama	Hātthigāma
Ambagama	Ambāgāma
Jambugama	Jambugāma
Sala	Sāla

Kusinara	Kuśināra
Adi-Parva	Adi-Parva
Kannamunda	Kaṇṇamuṇḍa
Rathakara	Rathakāra
Kunala	Kuṇāla
Mandakini	Mandākinī
Sihappapata	Sīhappapāta
Maniparvata	Maṇiparvata
Hingulaparvata	Hingulaparvata
Anjanaparvata	Añjanaparvata
Sanuprvata	Sānuparvata
Phalikaparvata	Phaḷkaparvata
Parasurama	Paraśurāma
Janasthana	Janasthāna
tritahyatra	tṛtahyātra
Dakshinapathapati	Dakshināpathapati
Pratishtana	Pratishtāna
Parayanavagga	Parayāṇavagga
Nipata	Nipāta
Vedisa	Vediśā
Savatthi	Sāvatthi
Mahismati	Mahīṣmati
Ujjayini	Ujjayinī
Sutanuka	Śutānukā
devadasi	devadāsi
Bhojakata	Bhojakaṭa
Benakata	Benakaṭa
Bhaja	Bhāja
Rsyamukha	Ṛṣyamukha
Avanti	Avantī
Pusyamitra	Puṣyamitra

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